FEBRUARY 23, 1935

Railway Age

FOUNDED IN 1856

GENERAL MOTORS

Announces

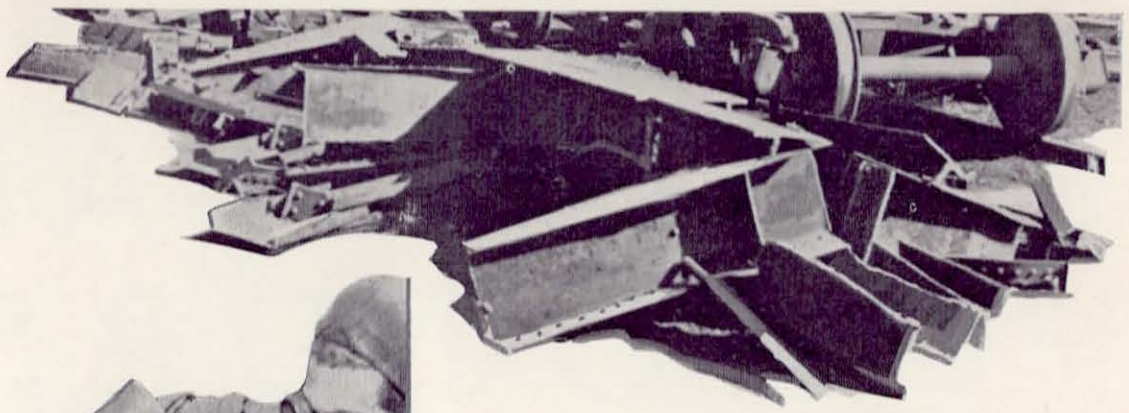
. . . . that in order to facilitate the conduct of its railway motive power activities, Electro-Motive Corporation, founded in 1922 and recently merged with Winton Engine Corporation, of Cleveland, Ohio, is again established as a separate General Motors subsidiary. The new corporation will build complete Diesel locomotives for road and yard service, and also, as in the past, will supply power plants for railway motor cars and stream-lined trains. Plant facilities are being provided in Chicago.

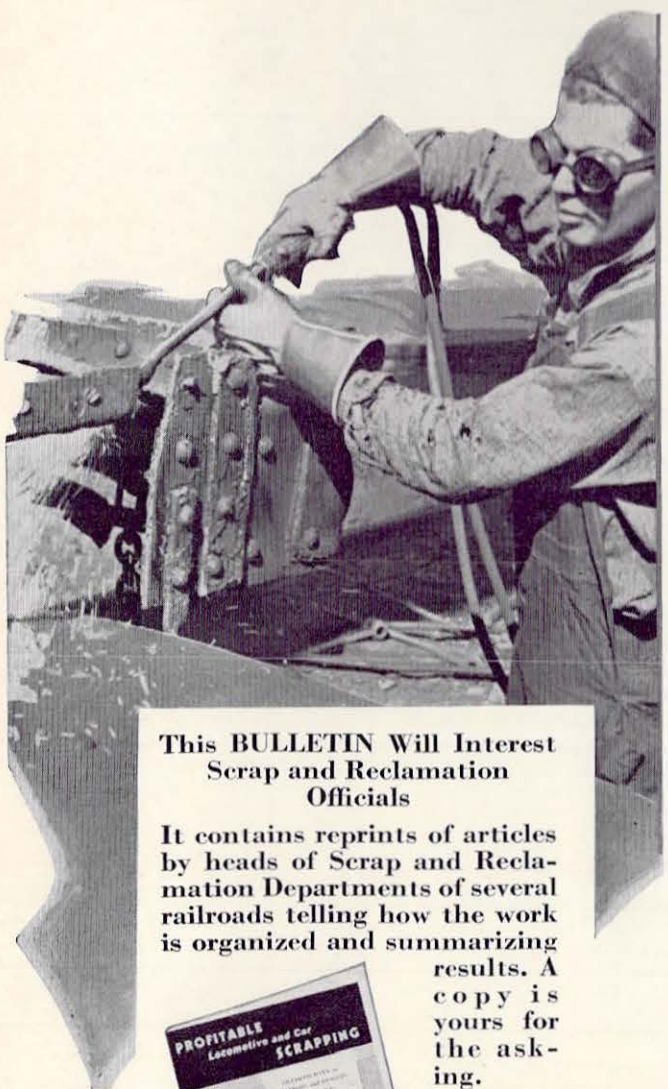
GM
GENERAL MOTORS

McCARTNEY LIBRARY
GENEVA COLLEGE

It pays

to use AIRCO Equipment in scrapping operations





This BULLETIN Will Interest Scrap and Reclamation Officials

It contains reprints of articles by heads of Scrap and Reclamation Departments of several railroads telling how the work is organized and summarizing results. A copy is yours for the asking.

It is particularly essential in scrapping operations to use efficient equipment. Inefficient apparatus or torches that require frequent adjustments run up your labor and gas costs.

Years of design and manufacturing experience are incorporated in AIRCO-DB Cutting Torches. In every respect they are quality products and with the full range of quickly interchangeable tips that is available, every bit of cutting can be done with the most economical use of gases.

It pays to use AIRCO-DB Equipment also because of the practical cooperation which AIRCO extends to all users of AIRCO products.

AIR REDUCTION
SALES COMPANY

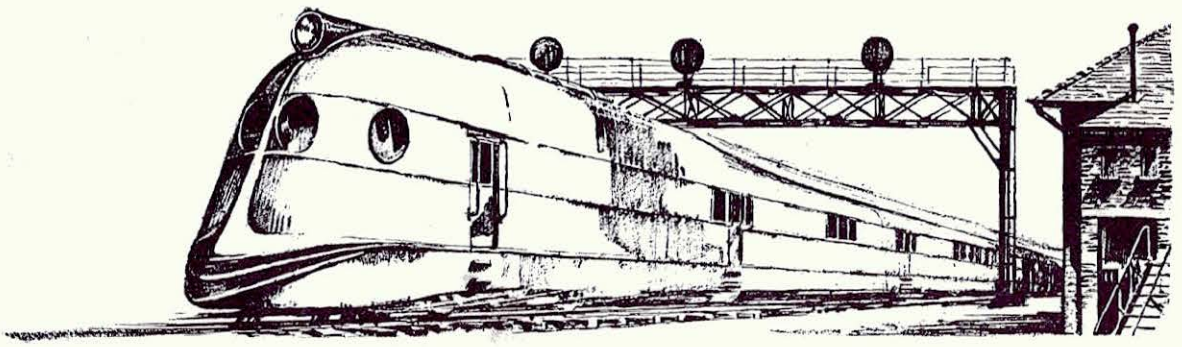
General Offices: 60 East 42nd St., New York, N. Y.

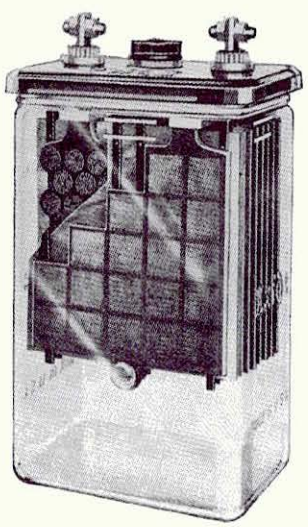
DISTRICT OFFICES and DISTRIBUTING STATIONS IN PRINCIPAL CITIES

Published weekly by Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879.

THE EXIDE A. C. FLOATING BATTERY SYSTEM

an outstanding development of 15 years ago that is vitally significant today





IN September, 1920, The Electric Storage Battery Company announced, "Something New in the World of Railway Signaling"—the Exide A. C. Floating Battery System. In the succeeding fifteen years, many railway developments have taken place, some of them revolutionary in nature. But what we said then of the Exide A. C. Floating System is as true today—and even more significant. Here is a quotation from the announcement:

"THIS IS WHAT IT MEANS IN INCREASED ECONOMY AND EFFICIENCY

A reduced power bill and reduced labor cost.
Increased efficiency of your signal system.
Abolishes the need of transporting batteries for charging.
Requires only one battery for each location.
Insures the battery being always fully charged.
Enables you to purchase A. C. power locally.
Guarantees the operation of your signals, even though the charging current is interrupted for any reason.
If A. C. track circuits are used, the battery may be charged from the same line.
Inspection and maintenance reduced to a minimum."

*Proof of the recognized value of this System is the fact that the majority of all new signals installed since 1925 have included the Exide A. C. Floating Battery System. In addition, a large mileage of signals have been changed over yearly from other sources of power supply to the Exide A. C. Floating Battery System.

Change-over from other forms of power supply invariably saves a large portion of the change-over cost annually, while new signal installations show even more favorable savings. Write for full information about Exide Signal Power.

Based on Railway Age yearly statistical figures.

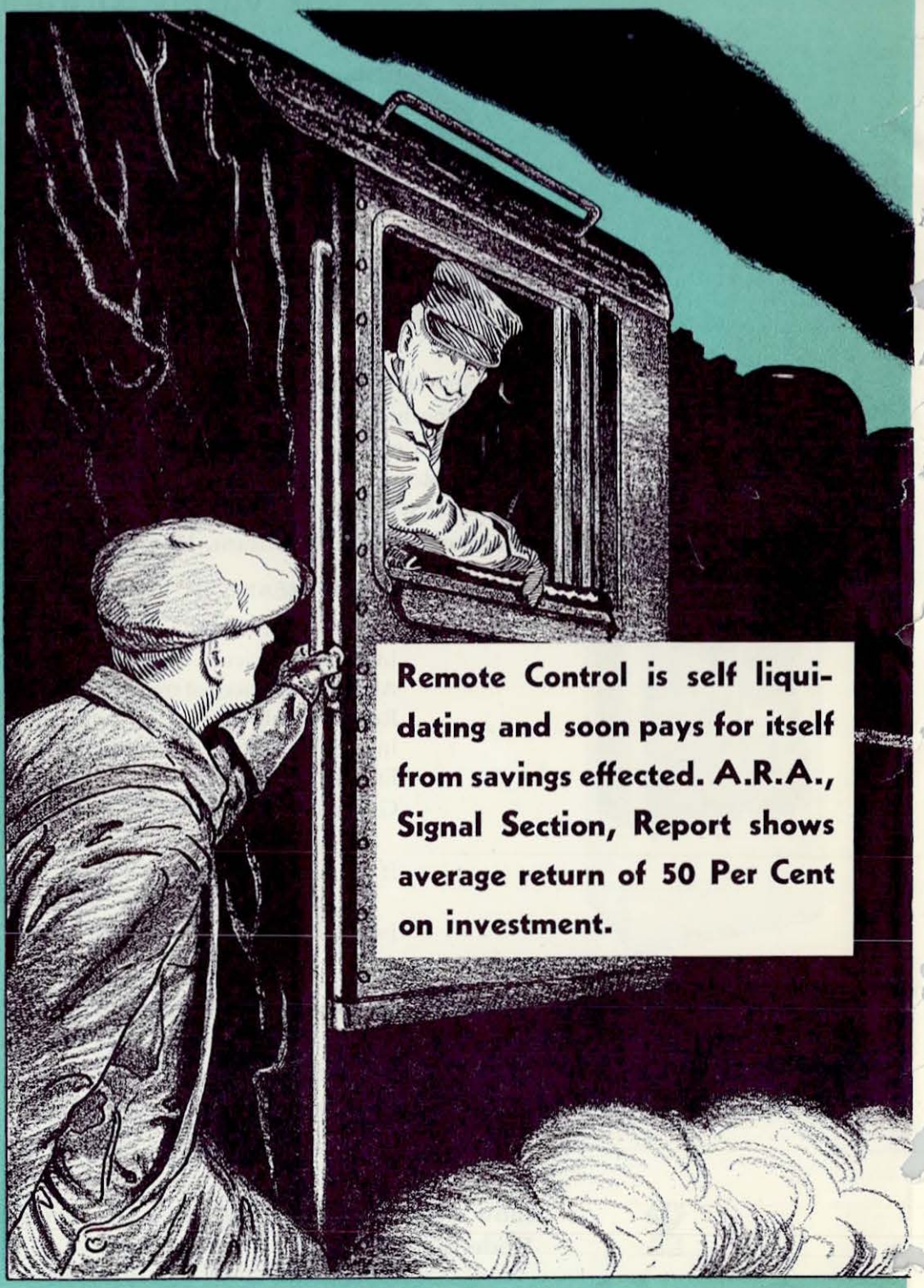
NRA CODE

Exide
SIGNAL POWER

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

HELPING TONNAGE TRAINS OVER THE

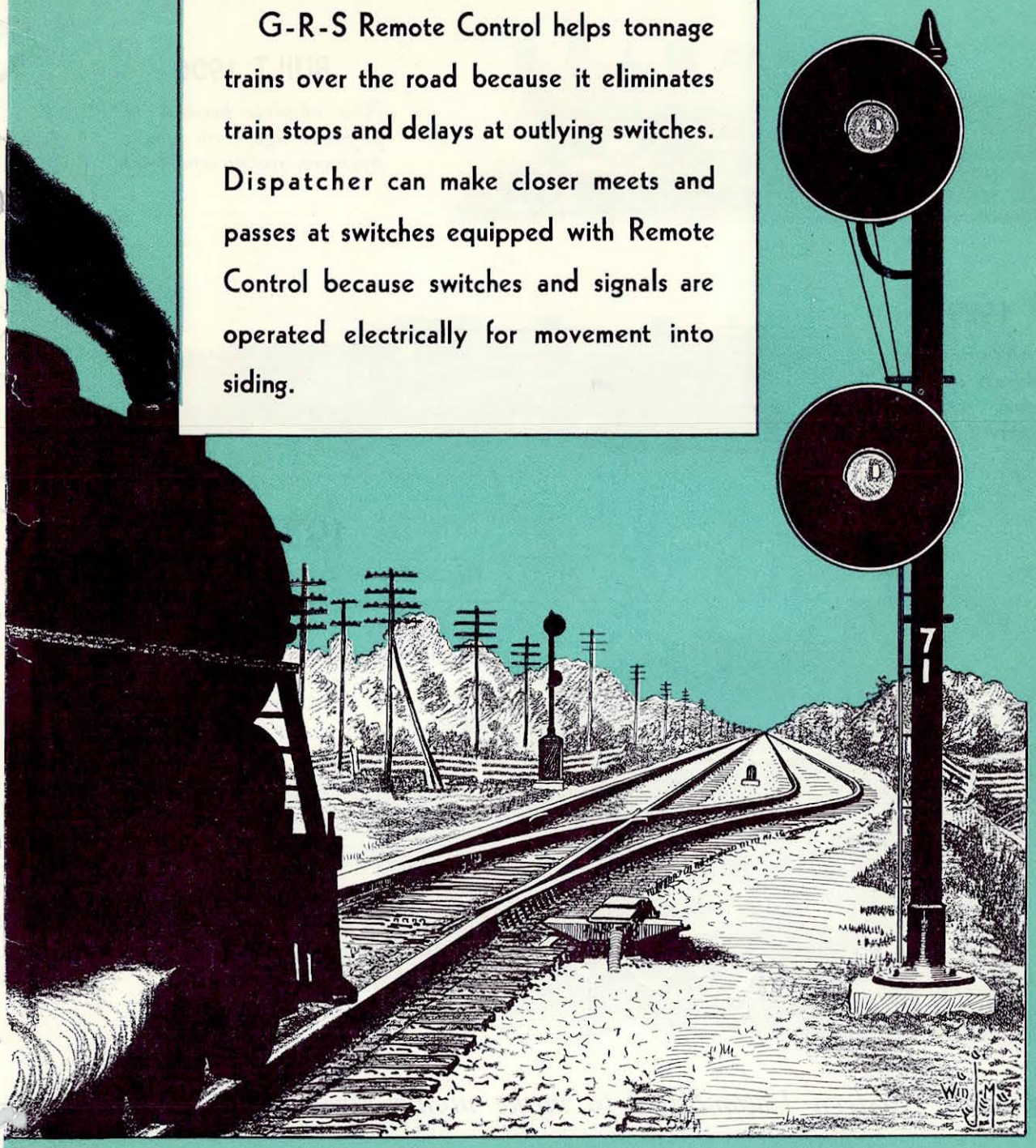
GRS



Remote Control is self liquidating and soon pays for itself from savings effected. A.R.A., Signal Section, Report shows average return of 50 Per Cent on investment.

ROAD WITH G-R-S REMOTE CONTROL

G-R-S Remote Control helps tonnage trains over the road because it eliminates train stops and delays at outlying switches. Dispatcher can make closer meets and passes at switches equipped with Remote Control because switches and signals are operated electrically for movement into siding.



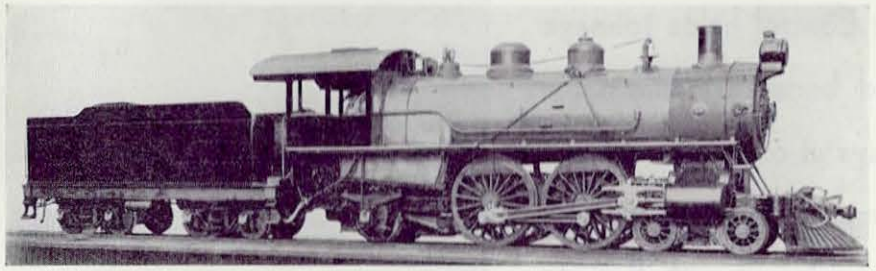
GENERAL RAILWAY SIGNAL COMPANY

New York Chicago ROCHESTER, N. Y. St. Louis A-1256

Montreal London Paris Tokyo Madrid Melbourne Calcutta Buenos Aires

WHICH WILL SERVE BEST

to lower costs and increase profits ?

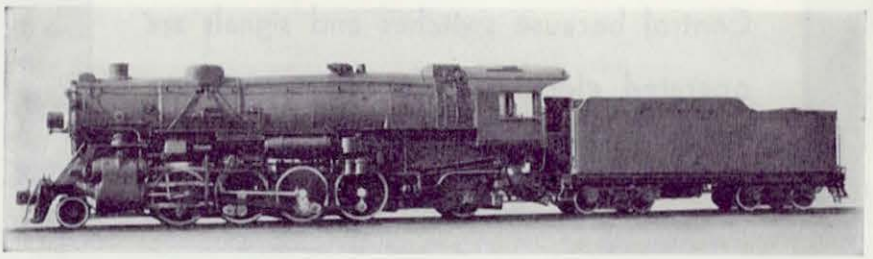


BUILT 1906

Now obsolete because of physical age, low steam pressure, and no superheat

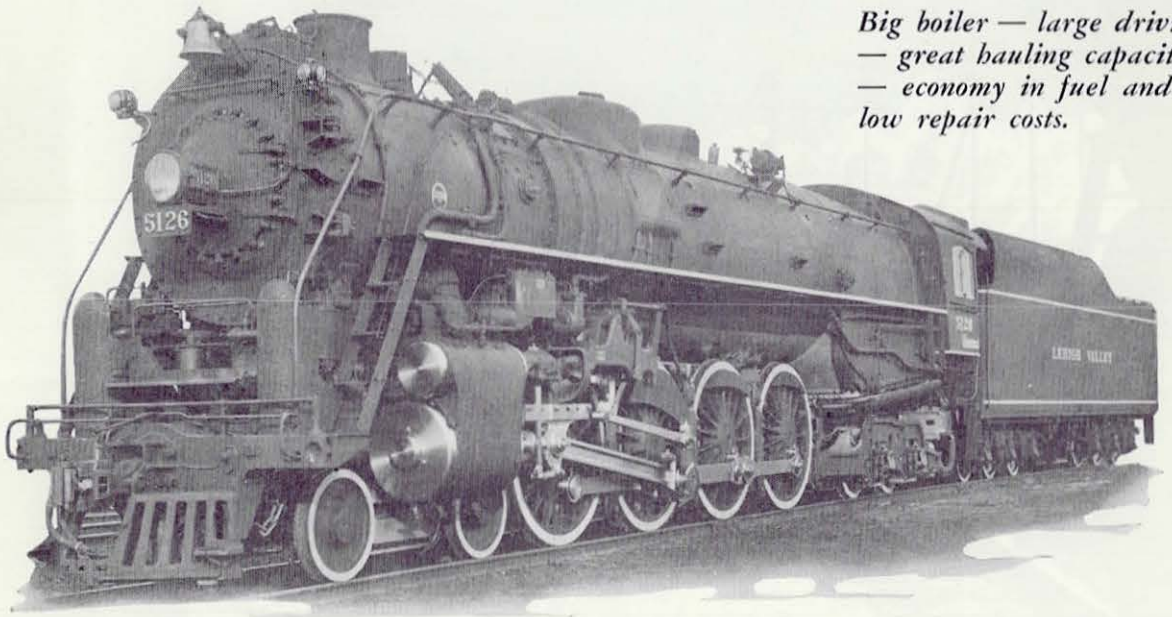
BUILT 1929

Already obsolete because the small drivers are inadequate for modern high-speed service.



1934

Big boiler — large driving wheels — great hauling capacity at speed — economy in fuel and water — low repair costs.

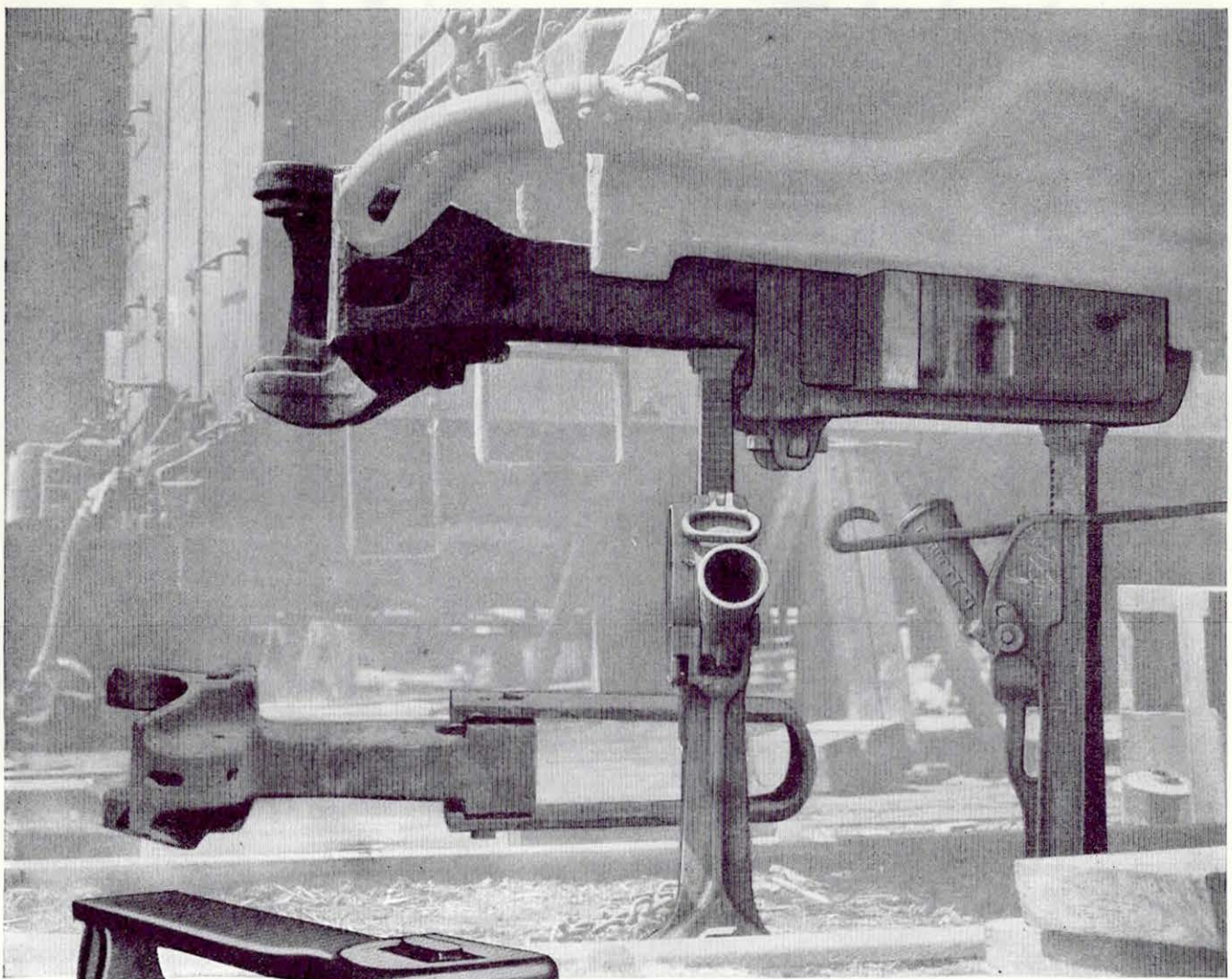


It takes Modern Locomotives to make money these days!

THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA

JANNEY VERTICAL KEY YOKES



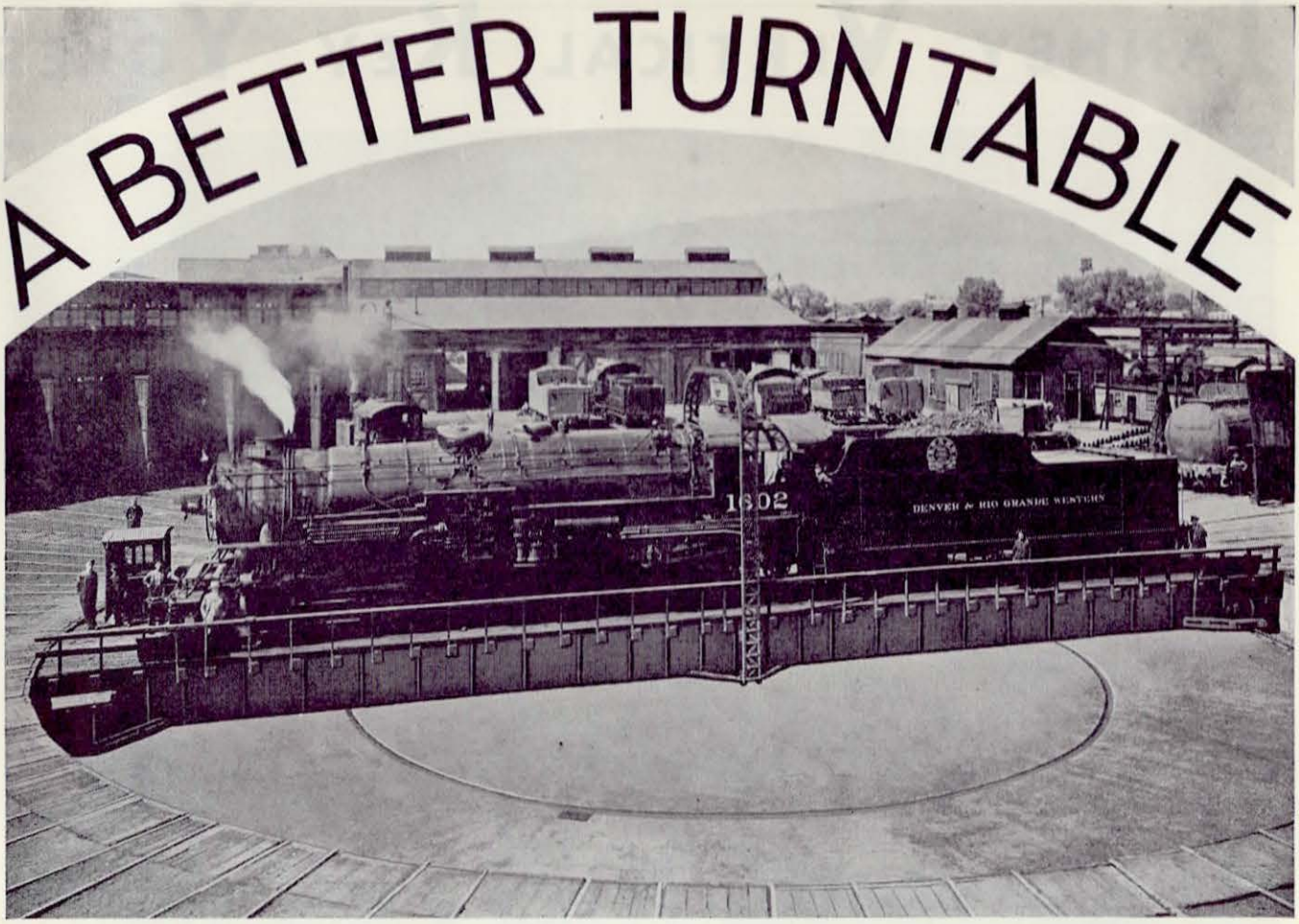
A Cast Steel Yoke for replacing wrought riveted yokes, that will eliminate the heavy maintenance expenses arising from loose yoke rivets.

When a wrought riveted yoke is replaced with a Janney Vertical Key Yoke, the original coupler is again used, the bridge of metal between the rivet holes in the coupler butt being burned out to form the Janney Key Slot.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

A BETTER TURNTABLE



AMERICAN Bridge Company Standard Continuous Turntables are self-contained machines, designed with due consideration for the dynamic effect of suddenly applied loads and proportioned for typical locomotives within the given length of each table.

Operating mechanism, being mounted on end trucks, increases the tractive force and avoids danger of wheel slipping. Continuity of structure across the center makes possible the use of relatively shallow girders which, being firmly braced together, give extraordinary transverse rigidity and strength and unvarying alignment of table rails with approach rails. Much longer locomotives can be turned on a given length of table. No time lost in balancing. No separate tractors or latches required. Shallow pits cost less for construction and maintenance and are easily drained. Other advantages and economies. Full information on request.

Fabricators and Erectors of All Classes of Steel Structures: Bridges, Buildings, Towers, Sub-stations

AMERICAN BRIDGE COMPANY

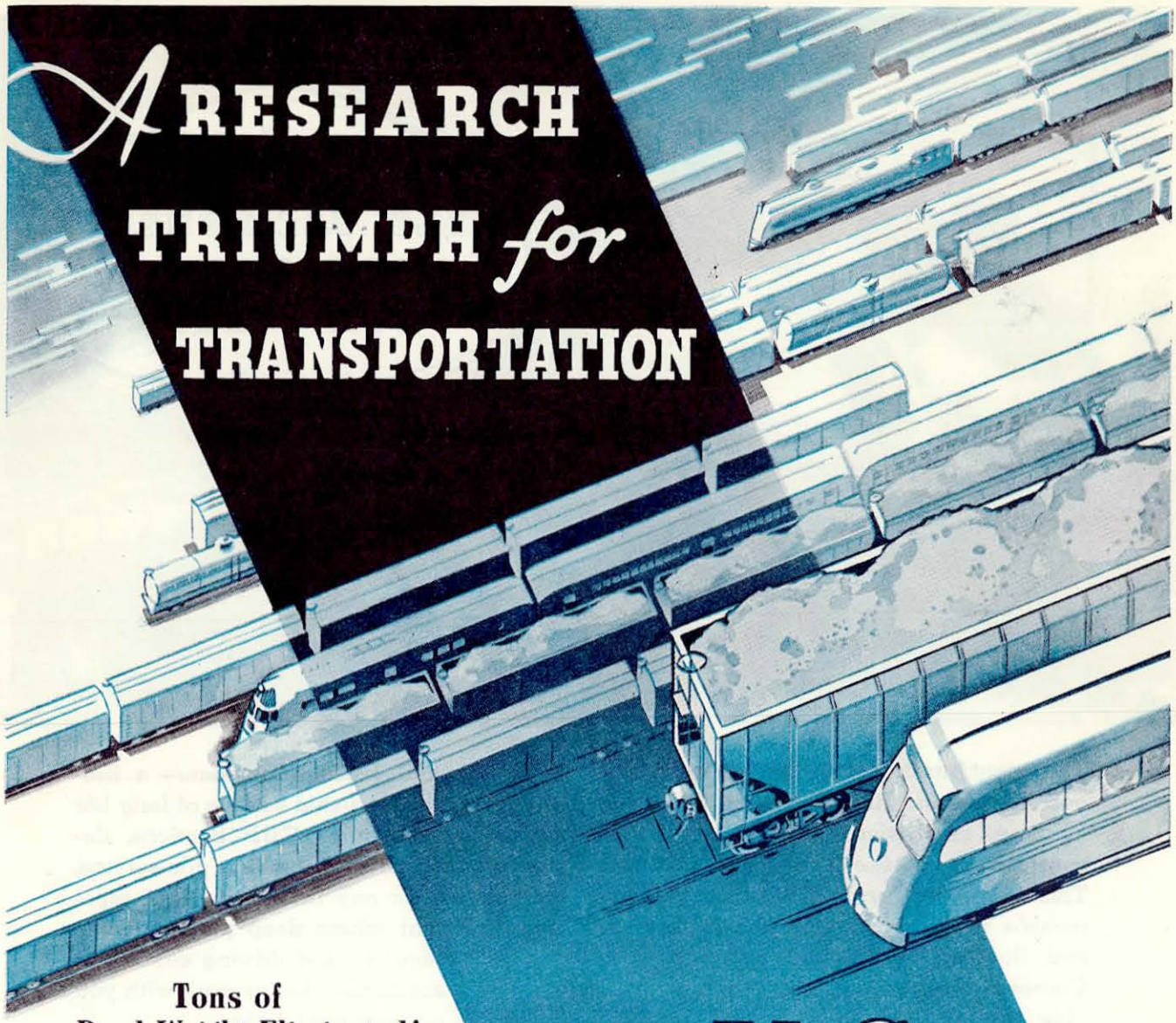
GENERAL OFFICES: *FRICK BUILDING • PITTSBURGH, PA.*

Baltimore Boston Chicago Cincinnati Cleveland Denver Detroit Duluth Minneapolis New York Philadelphia St. Louis Salt Lake City

Pacific Coast Distributors: Columbia Steel Company, San Francisco • *Export Distributors:* United States Steel Products Company, New York

United States Steel USS *Corporation Subsidiary*

A RESEARCH TRIUMPH for TRANSPORTATION



Tons of Dead Weight Eliminated!

Greater pay-load capacity provided! U S S research has made this practicable through a series of high-strength alloys in which the leading grades are corrosion-resistant U S S COR-TEN, and U S S 18-8 Stainless Steel. Available in the same forms as mild steel, U S S High Tensile Steels have progressively higher physical properties.

The atmospheric corrosion resistance of U S S COR-TEN is based upon ACTUAL TESTS extending over a period of years in several different atmospheres. Our statements are based on this actual experience, not upon accelerated or laboratory tests.

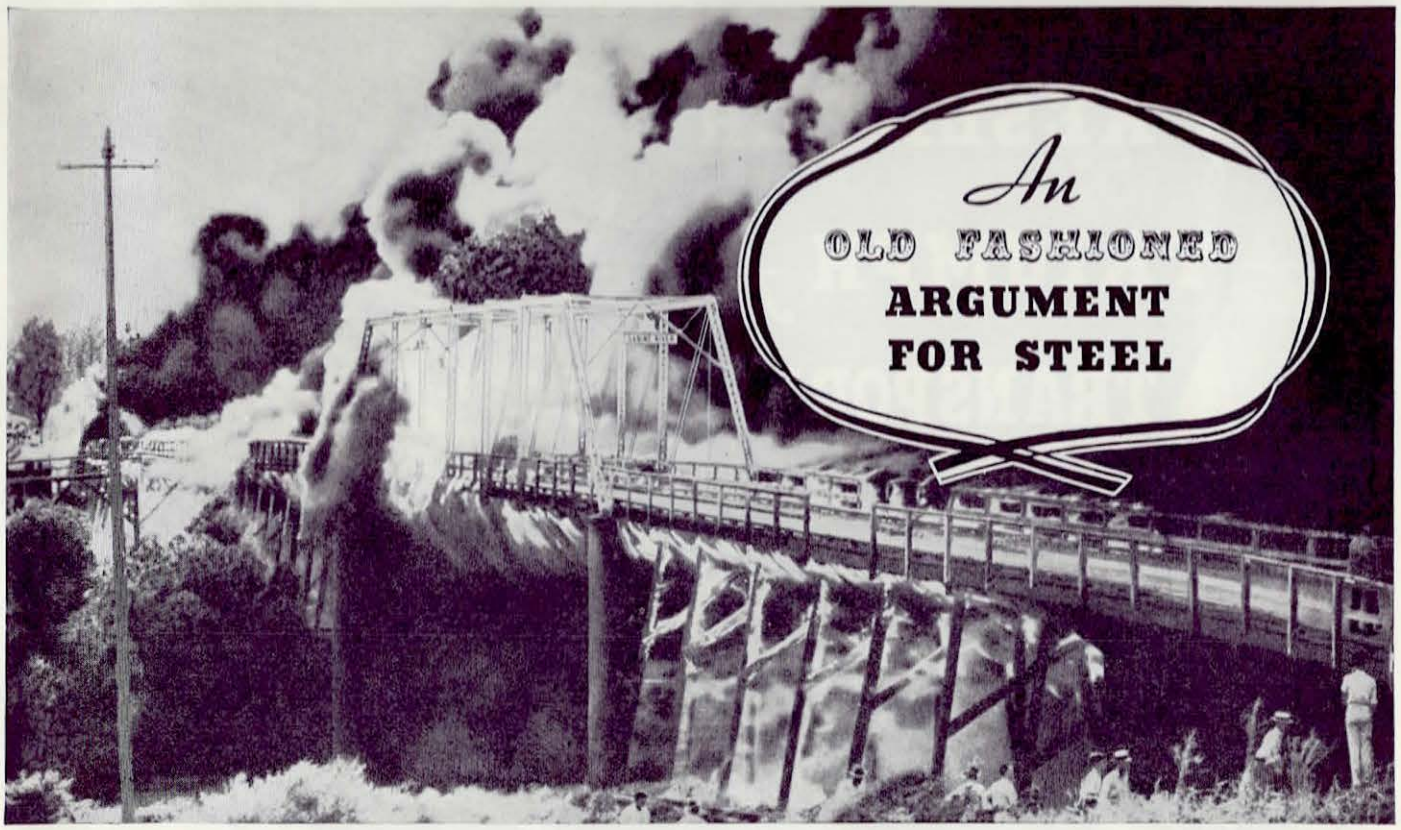
USS HIGH-TENSILE STEELS

U S S High Tensile Steels are supplied in shapes, plates, bars, strip, sheets, rods, wire and wire products, pipe and tubular products. Write for information and literature. Address following manufacturing companies:

AMERICAN SHEET AND TIN PLATE COMPANY, *Pittsburgh* TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
AMERICAN STEEL & WIRE COMPANY, *Chicago* COLUMBIA STEEL COMPANY, *San Francisco*
CARNEGIE STEEL COMPANY, *Pittsburgh* ILLINOIS STEEL COMPANY, *Chicago* NATIONAL TUBE COMPANY, *Pittsburgh*

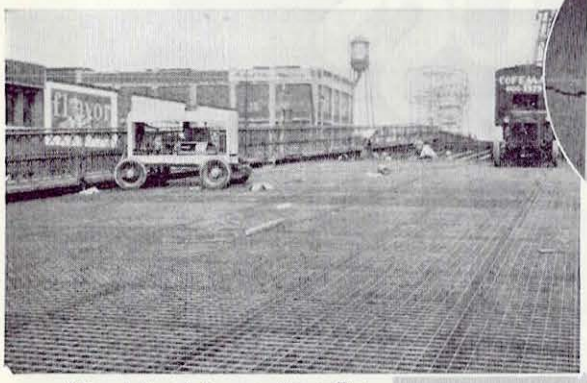
Pacific Coast Distributors—COLUMBIA STEEL COMPANY, San Francisco, Calif. *Export Distributors*—UNITED STATES STEEL PRODUCTS CO., New York, N. Y.

United States Steel Corporation Subsidiaries

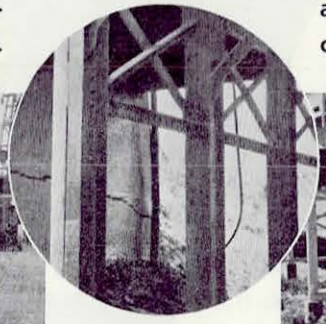


The recent burning of the Logansport Bridge over the Sabine River between Texas and Louisiana emphasizes the need for all steel construction because of its firesafe qualities. This was a steel bridge, it is true, but vulnerable in its wood approaches, supports and flooring. • Several new Carnegie developments now provide this all-steel construction.

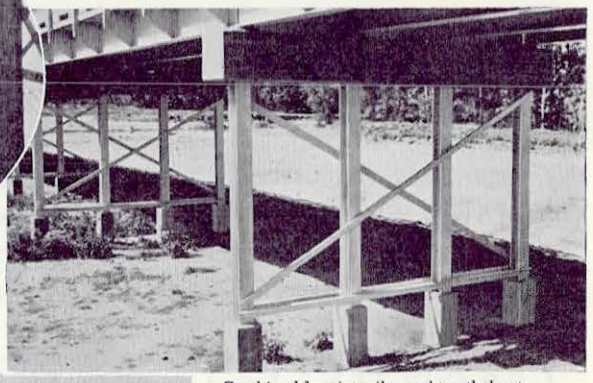
T-Tri-Lok and I-Beam-Lok assure a fireproof, armored, anti-skid surface of long life and high efficiency. CBP Sections, designed particularly for bearing pile service, are suitable for any installation, but especially efficient where deep penetration is required and driving conditions are severe. Let us work with you on your next design.



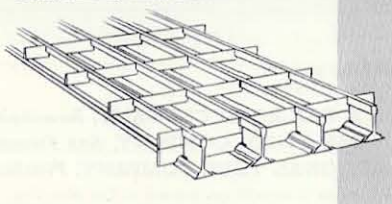
I-Beam-Lok ready for concreting on East Grand Boulevard Viaduct over the Grand Trunk Railway lines, Detroit.

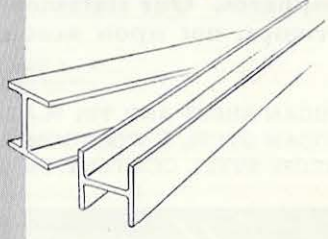


Showing excellent condition of fabricated steel bearing piles after thirty-five years of exceptionally severe service.



Combined bearing piles and trestle bent members on approaches to the recently completed bridge at Leeper, Mo.

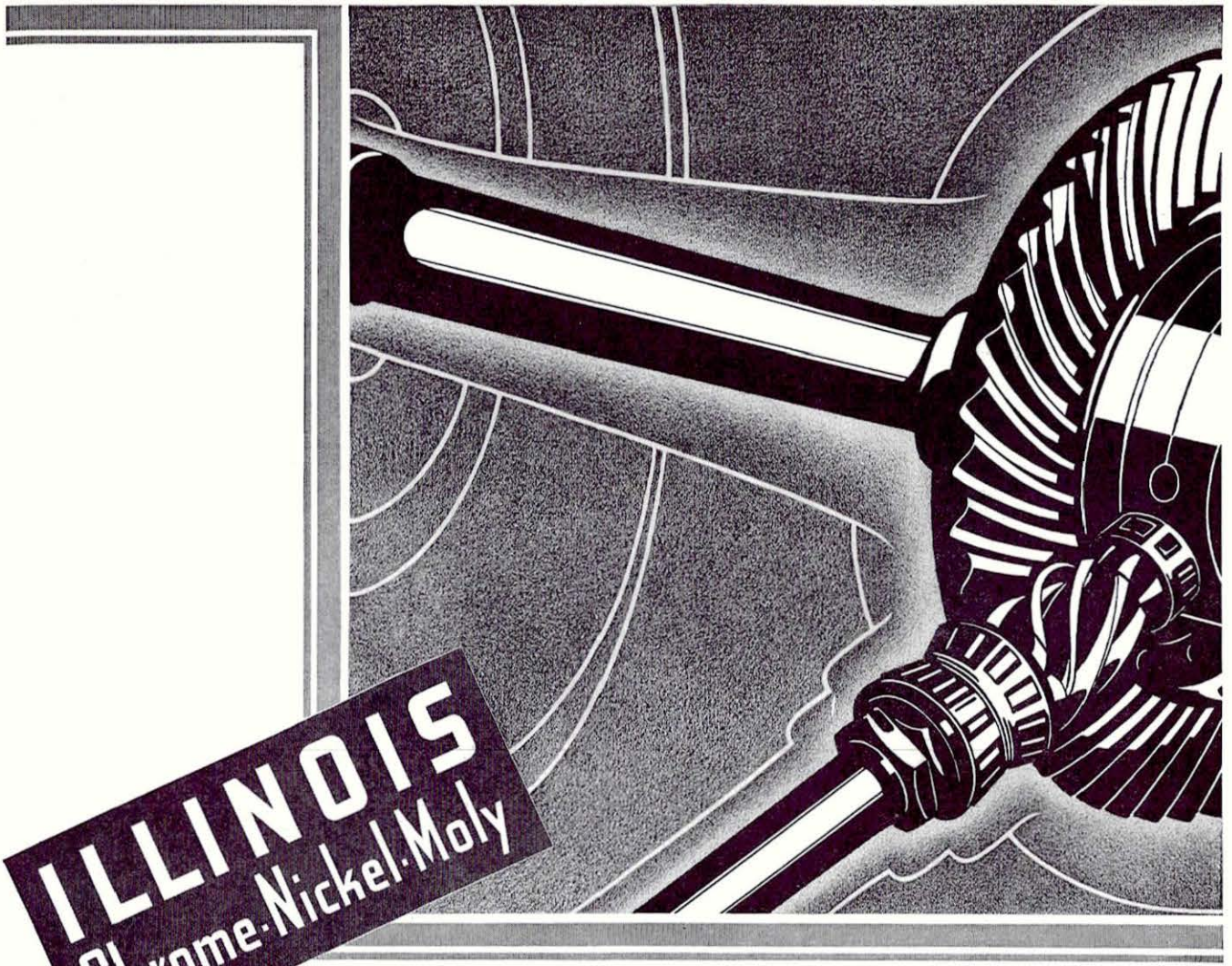




CARNEGIE
STEEL COMPANY

PITTSBURGH PENNSYLVANIA

SUBSIDIARY OF UNITED STATES STEEL CORPORATION



WHERE TORSIONAL STRESSES RUN HIGH

FOR axles and shafts requiring high torsional strength, Illinois is producing a Chrome-Nickel-Moly steel that has achieved notable successes. This steel has an unusual capacity for absorption of torsional stresses. Hence, failures are rare.

Chrome-Nickel-Moly, despite its superior physical properties, presents no unusual machining difficulties.

For trucks and bus axles, jack shafts on power excavators and cranes, and for many applications where additional strength is required without a corresponding increase in the size or weight of a shaft, it will pay to investigate Illinois' Chrome-Nickel-Moly.

Additional information will be sent upon request.

ILLINOIS STEEL COMPANY

208 SOUTH LA SALLE STREET, CHICAGO, ILLINOIS

United States Steel U.S. STEEL *Corporation Subsidiary*

SALES JUMP

. . . but that's not the whole story!

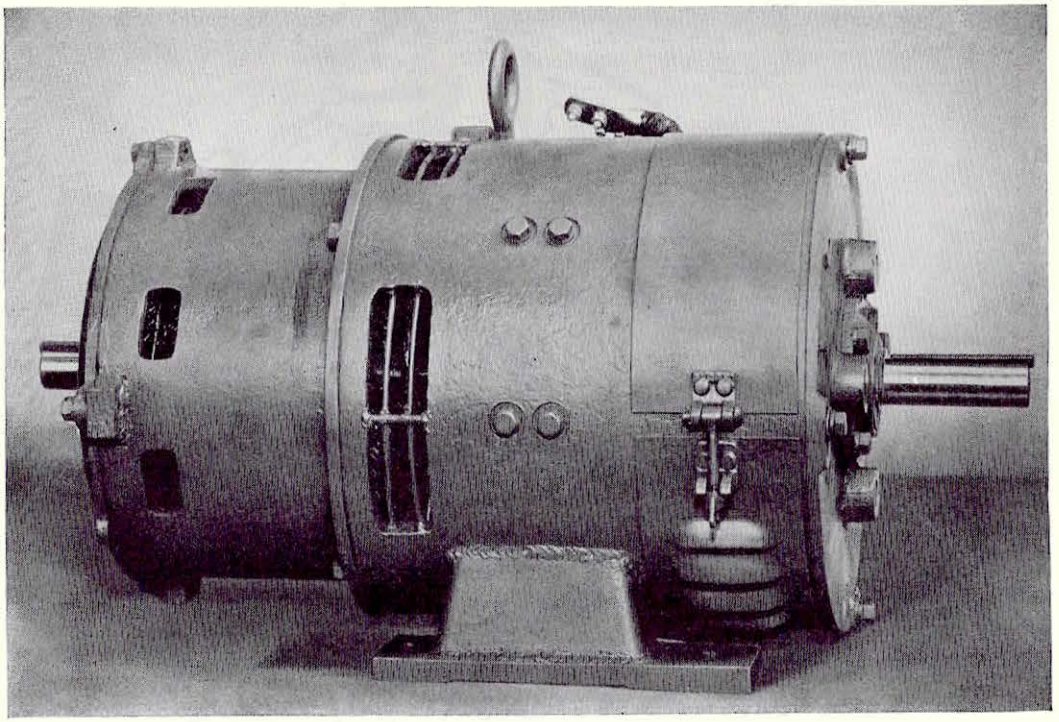
84% more railroad cars (3500 as compared to 1900) will be equipped for air-conditioning during 1935 than in 1934. In the 3-month period ending February 1st Edison sales for railroad car lighting and air-conditioning increased at 3 to 4 times that rate—or 302%—compared to the sales of the same period a year ago. This can only mean—now that air-conditioning of railroad passenger cars is here to stay—that the greater ruggedness of the Edison Battery is recognized as the prime requirement for dependable operation and true economy. Edison Batteries can be operated in parallel . . . they can accept a high charging rate . . . they are more easily kept charged. They cost less on a per-car-mile basis!

EXCLUSIVE!

The dependability of Edison Batteries comes from numerous exclusive features, such as steel construction, a steel-preservative (alkaline) electrolyte and a correct electrochemical principle. These features help explain why it is that the only way to enjoy Edison performance is to use Edison Batteries.

EDISON STORAGE BATTERY

DIVISION OF THOMAS A. EDISON, INC., WEST ORANGE, NEW JERSEY



WESTINGHOUSE A-C.–D-C. COMPRESSOR MOTOR FOR RAILWAY CAR AIR CONDITIONING.

FEATURES

Occupies minimum space, light in weight, rugged, equipped with anti-friction bearings.

LOW-COST, PRE-COOLING

FOR RAILWAY PASSENGER CARS - - - with Westinghouse A-C.–D-C. Compressor Drive

STAND-BY power for yard or terminal operation! Westinghouse a-c.—d-c. compressor motors were built to make possible this low cost convenient pre-cooling of railway passenger equipment.

The a-c.—d-c. motor operates from either the car power supply or from the a-c. supply at the yard or terminal. When cooling from a-c. power, if desired, the battery can be charged by the d-c. motor changed over to a generator thus obviating the necessity of heavy low-voltage battery-charging leads.

The d-c. motor can be supplied for operation from either a 32, 64 or 110-volt car lighting circuit.

The a-c. motor is wound for both 220 and 440 volt, 3-phase, 60-cycle power supply.

More than 250 of these motors and their complimentary control are now in service or on order. Completely developed and thoroughly successful for over three years, these motors are your best buy for air conditioning compressor drive.

Complete information will be supplied to you by our nearest representative, or address Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa.

★ *Westinghouse 15 and 20 kw. generators are available with either gear or belt drives.*

R 53011

Westinghouse

WESTINGHOUSE ELECTRIC

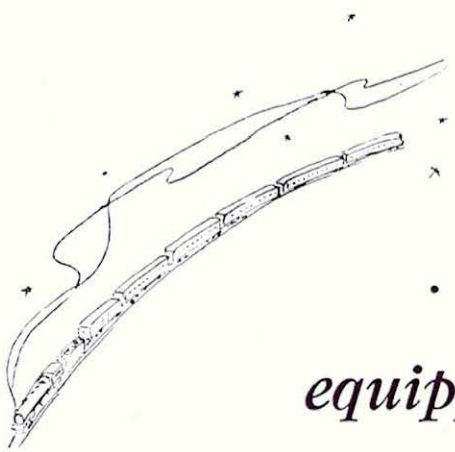
Rolled from a solid billet, there can be no weak spots in **J&L** Hot Rolled Seamless Steel Locomotive Boiler Tubes. Since there is no joining of metal, there are no welds to open under the stress of service. Strength is *inherent* in the **J&L** seamless process. **J&L** Boiler Tubes comply with all recognized specifications. Furnished in a full range of standard sizes, from 1" O.D. to 6" O.D. inclusive.

OTHER J&L STEEL RAILWAY MATERIALS

TIE PLATES . . . Hot and Cold Worked TRACK SPIKES STEEL PILING
CENTER SILL BEAMS, BULB ANGLES . . . AND OTHER CAR SHAPES
GALVANIZED TIE DATING NAILS RIGHT-OF-WAY FENCE
COLD FINISHED STEEL STEEL PIPE . . . Welded and Seamless, Black and Galvanized

JONES & LAUGHLIN STEEL CORPORATION
AMERICAN IRON AND STEEL WORKS
JONES & LAUGHLIN BUILDING, PITTSBURGH, PENNSYLVANIA

J&L STEEL



ALL'S WELL

. . . the Chef's in his Galley

equipped with "Armco Stainless"

ARMCO

SHEET METAL

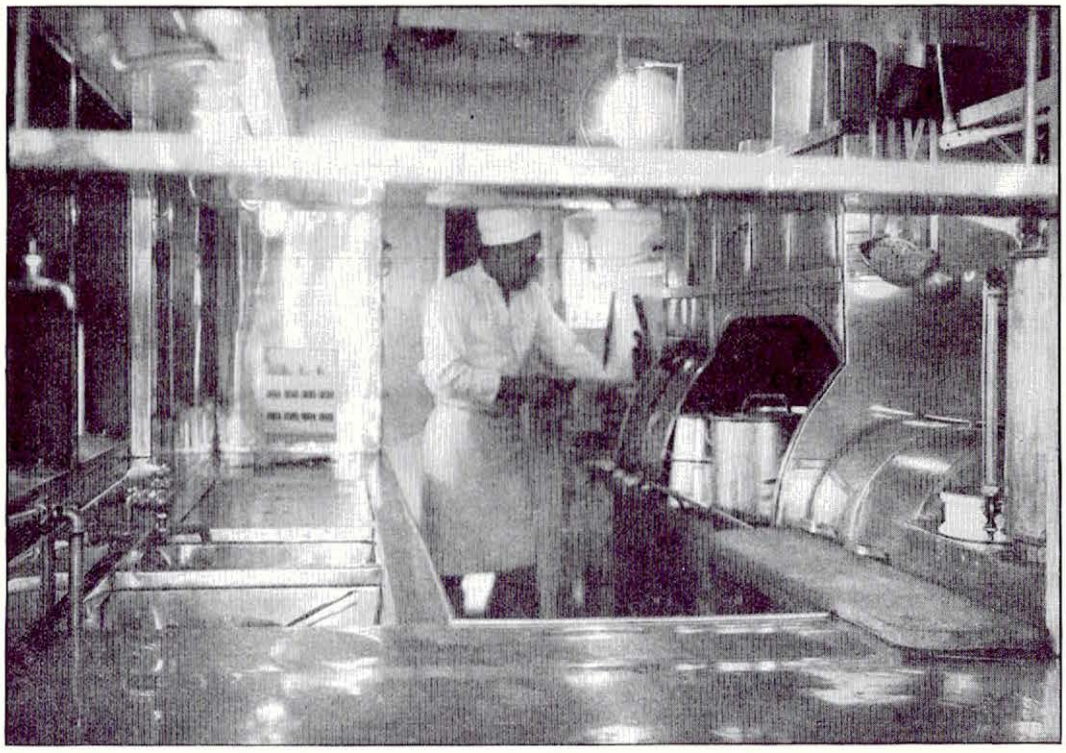
•

PLATES

•

FOR EVERY RAILROAD NEED

•



YES, sir! All is well in the working end of your dining cars when they're equipped with Armco Stainless . . . .

Armco Stainless Steel sinks, work-boards, refrigerator doors, cupboards, compartments, and all the rest. Every inch of surface is spotless, non-tarnishing, sanitary, and surprisingly easy to clean and keep clean.

This is something to consider, too: as long as your diners are in service, there will never be any replacements when the parts that food touches are made of Armco Stainless. You're assured of sanitary, trouble-free service from first run to last.

There is a correct grade of Armco Stainless Steel sheets, strip and plate for practically every railroad use. The six painstakingly finished surfaces are well adapted to varying requirements. And remember, Armco Stainless Steels are readily sheared, punched, formed, soldered and welded. Your mechanical department can do anything with these bright, modern metals that they can do with the older metals—and more.

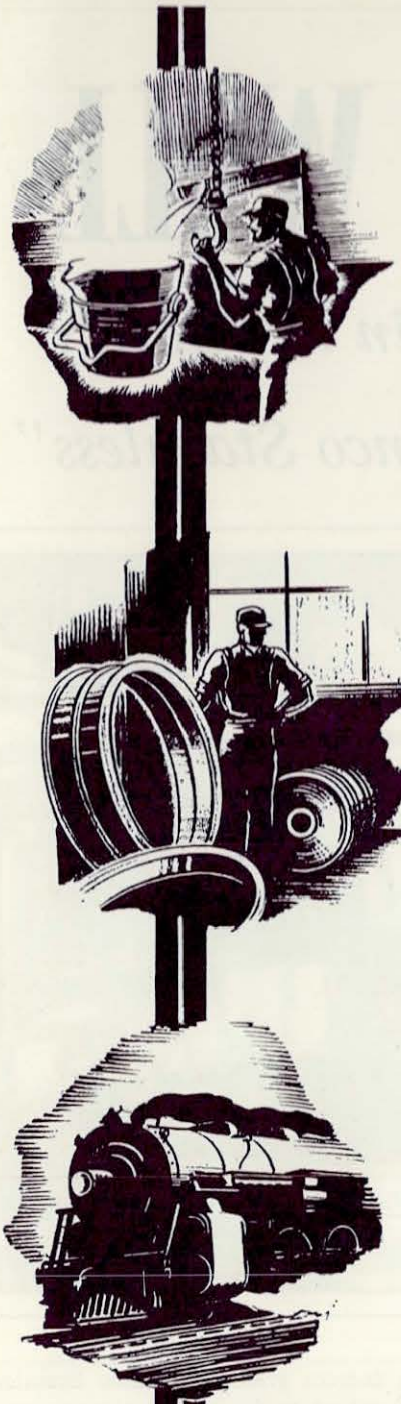
We shall be glad to work with you in the successful application of "Armco Stainless". Just inform the nearest office of your needs.

ARMCO RAILROAD SALES CO.

• *Subsidiary of The American Rolling Mill Company* •

Executive Offices: MIDDLETOWN, OHIO . . . . . District Offices: CHICAGO . . . . . CLEVELAND . . . . . NEW YORK

PHILADELPHIA . . . . . ST. LOUIS . . . . . SAN FRANCISCO



When you see how we make our own steel to assure the quality of the product . . . . . .

When you see how we work the ingot into the finished part and heat-treat it to refine the structure and relieve internal strain . . . . .

When you see how these parts stand up under the loads and speeds of modern service, you too will specify—

"STANDARD"

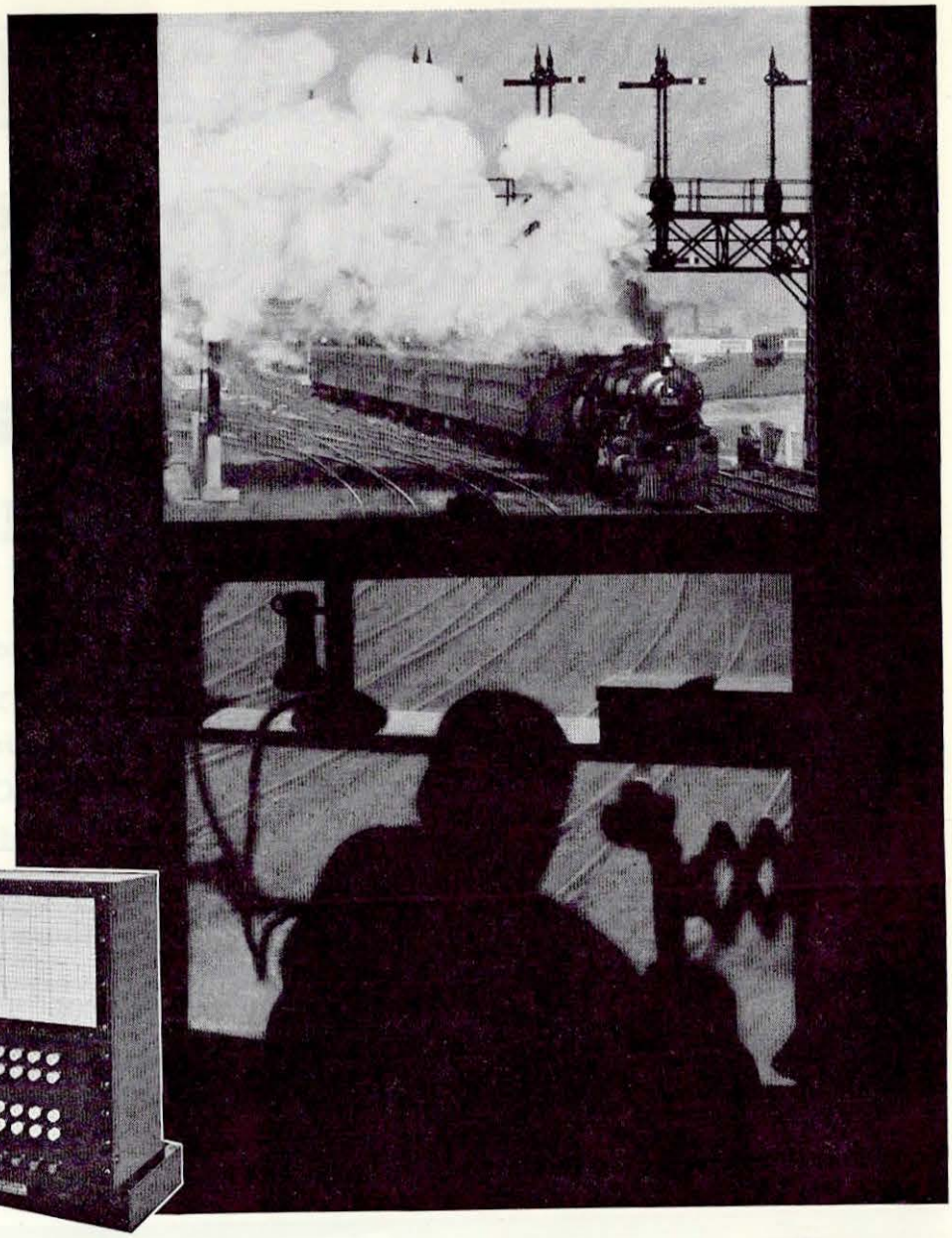
TIRES • STEEL WHEELS • AXLES
FORGINGS CASTINGS

STANDARD STEEL WORKS COMPANY

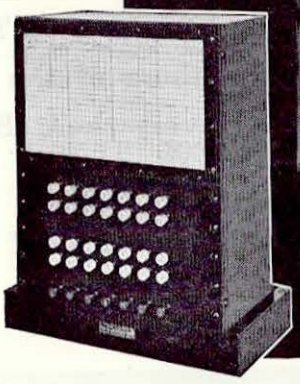
SUBSIDIARY OF THE BALDWIN LOCOMOTIVE WORKS

GENERAL OFFICES & WORKS: BURNHAM, PA.

NEW YORK CHICAGO PORTLAND AKRON
PHILADELPHIA ST. LOUIS SAN FRANCISCO



No. 62A Selector Key for desk mounting—No. 62B similar. Nos. 63A and 63B are for switchboard mounting.



Partners in maintaining fast, safe, on-time service

All the leading roads have long found Western Electric apparatus a dependable partner. Positive in action, this dispatching equipment makes possible accurate train control.

Motor-driven Selector Keys 62A, 62B, 63A and 63B provide great flexibility and fast, easy operation. "A" numbers call up to 78 stations on a single line; "B" numbers call up to 241 stations.

The 60AP Selector—which operates on predetermined electrical impulses—indicates incoming calls both visibly and audibly. When operated on 17 impulses, it has a capacity of 78 stations—on 27 impulses, 241 stations. The 60BP Selector has 4 selective ringing terminals, any one of which can be closed independently by the same selector. Type AP receives time signals; type BP does not.

Loud Speaking Telephones, Jack Boxes and other equipment are all designed to meet railroad needs. For details, write to Graybar Electric, Graybar Building, N. Y.—or telephone Graybar's nearest branch.

• • •

Western Electric also produces cables for telephone and telegraph services. Lead covered, impregnated jute protected and tape armored types—made to your specifications by Bell System cable specialists.

Western Electric

TRAIN DISPATCHING TELEPHONE SYSTEMS

***Distributed by* GRAYBAR ELECTRIC COMPANY**

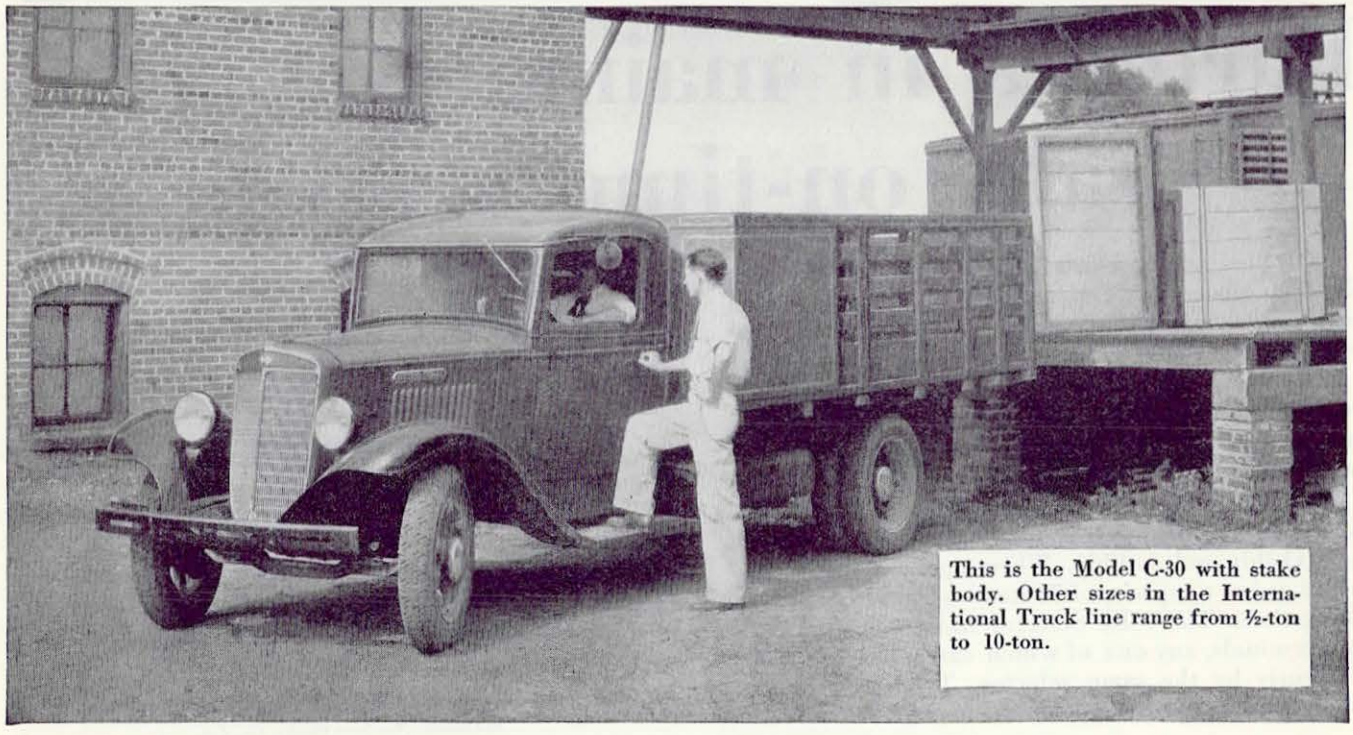
In Canada: Northern Electric Co., Ltd.

INTERNATIONAL TRUCKS

LOWEST-PRICED 1½-ton 6-cylinder TRUCK IN INTERNATIONAL HISTORY

● International Harvester now offers by all odds the best value in this popular field, considering beauty of design, high standards of quality throughout, and operating economy. A 78.5 h. p. engine and sturdy ALL-TRUCK construction in a truck of ultra-modern style. Inquire of one of our 217 Company-owned branches or of any International Truck dealer. See the new Model C-30 and others of the new streamlined Internationals now on display everywhere. Better still, try one out on your own job.

INTERNATIONAL HARVESTER COMPANY
OF AMERICA
(INCORPORATED)
606 So. Michigan Ave. Chicago, Illinois



This is the Model C-30 with stake body. Other sizes in the International Truck line range from ½-ton to 10-ton.

OVER 24 MILLION NOW IN SERVICE

Any sustained increase of car loadings such as witnessed during the past few weeks will necessitate conditioning for service of present idle cars and resumption of orders for new rolling stock.

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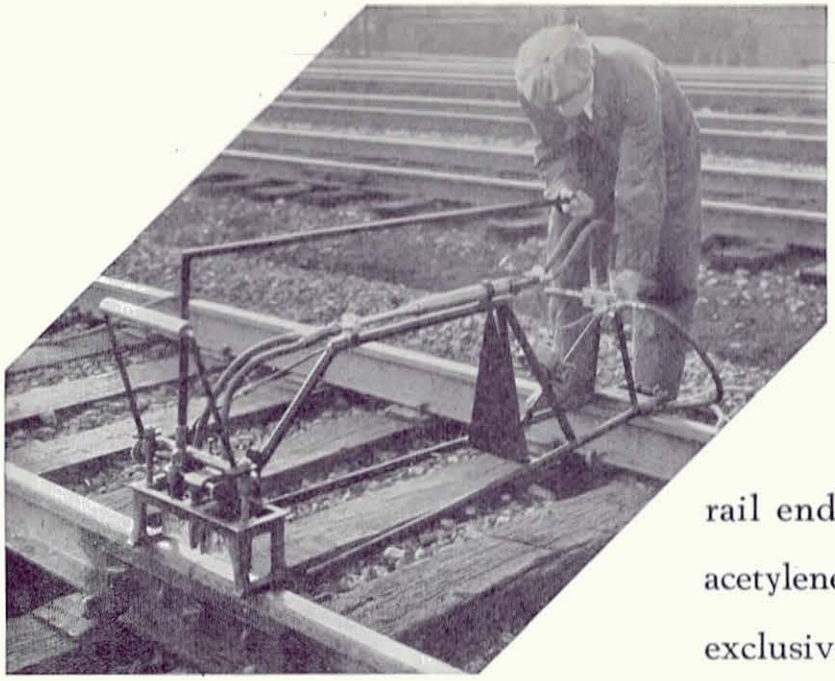

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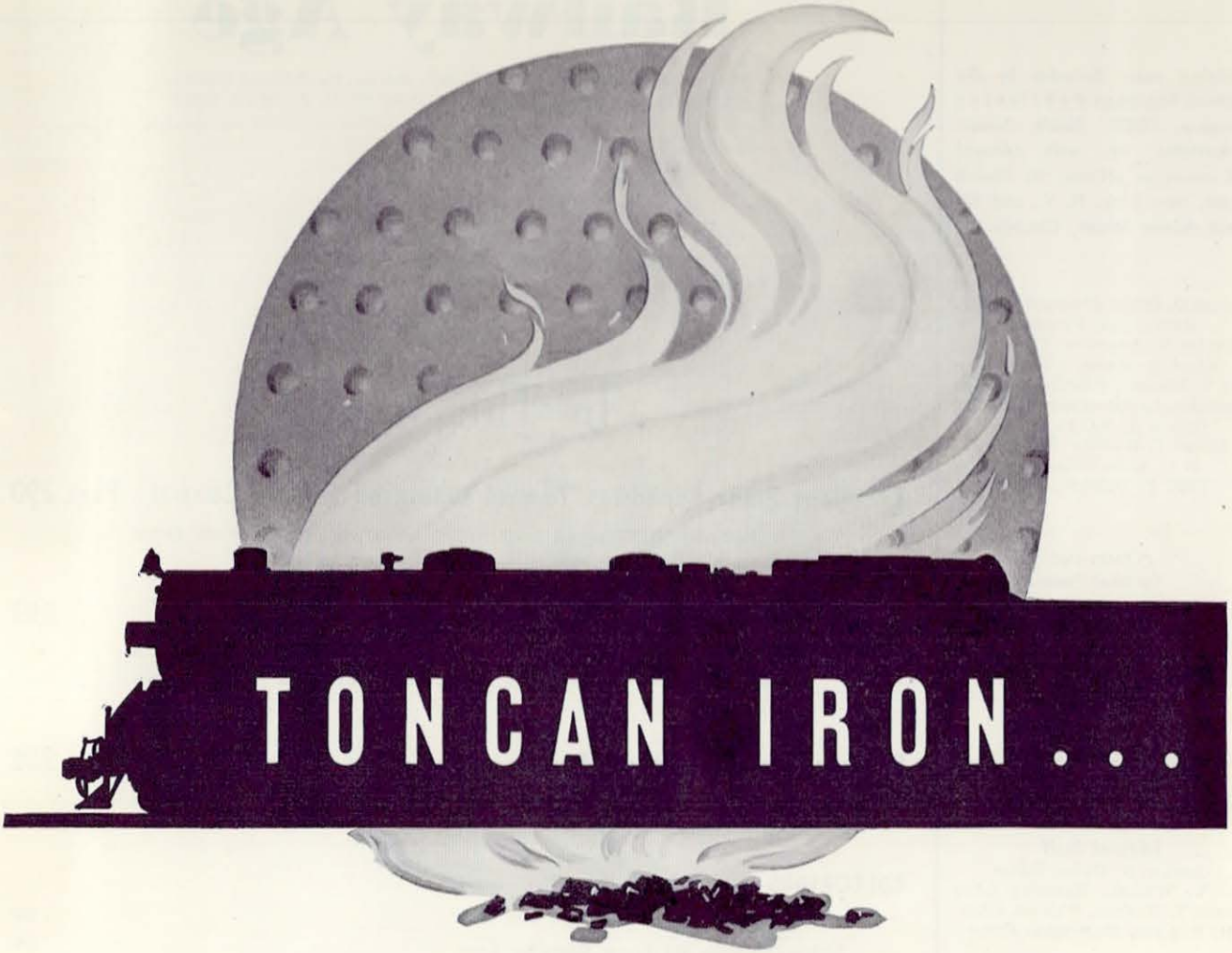

is curing side sheet troubles

Modern locomotives must generate steam faster. Fireboxes are necessarily larger and encounter more severe service.

Many a big locomotive has found that the old-time steel sheet cracks, fails and must be renewed in relatively short time.

Toncan Iron, however, has an exceptional resistance to fire-cracking and on scores of Super-Power locomotives is outlasting steel sheets many times.

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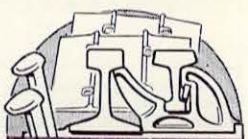

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RAILWAY AGE

Which Depression Should Be Dealt With Now?

In the two weeks that ended February 9 railway car loadings were relatively as large as in March, 1934, when they were relatively the largest in any month since October, 1931. In other words, the seven months' decline of general business which ended in October, 1934, has been followed by a four months' increase which has made it somewhat better than a year ago and as good as at any time within the last three and one-half years.

The trouble with the total improvement, which actually first began in the last one-third of 1932, has been that it has been so often interrupted and has been comparatively small. At the real bottom of the depression in August, 1932, car loadings were 48 per cent of the 1925-1929 average. They are now about 64 per cent of that average. This is relatively a gain of 33 per cent. It represents, however, a recovery of less than one-third of the freight business that the railways lost during the decline from prosperity to the bottom of the depression. It cannot be said that much recovery has been accomplished when, since August, 1932, general business has regained less than one-third of the ground that it lost during the preceding less than three years.

Fighting the Next Depression

In large measure the recessions of business, and consequent small total recovery accomplished, especially during the last two years, have been due to well-intended efforts to prevent the next depression and its effects, whereas the real and pressing problem is to terminate the present depression and its effects. We have seen this illustrated by the legislative and administrative efforts made in Washington to reform business. We are now seeing it illustrated by the efforts being made there to provide work relief and security. Nobody questions that relief should be provided for the unemployed. Nobody questions that whatever reasonably can be done should be done to provide greater security for persons with small incomes. But any policies which tend to prevent reemployment now increase the need for relief now, and any policies that tend to hinder revival of business now tend to prevent reemployment. The best way to provide relief and security is to restore to the unemployed at reasonable wages the jobs in private business that they formerly had.

It seems difficult or impossible to get public men and labor union leaders to apply their minds and energies to the economic problems that must be solved now in order to cause a large increase of employment in private business in the immediate future. Consideration is being given to taxation of pay-rolls to provide a fund for unemployment insurance. But the size of pay-rolls and, therefore, the amount of revenue that can be derived from a tax upon them, is determined by the gross earnings of business. As long as the gross earnings, and, therefore, the pay rolls of many industries remain as small as they are now the amount that can be collected by taxing their pay rolls necessarily will remain correspondingly small. Furthermore, a tax upon pay rolls will have exactly the same effect upon the expenses of every business as an equivalent increase of wages. In every business in which gross earnings are now inadequate a pay-roll tax will immediately be offset by a curtailment of the pay roll either by a reduction of employment, a reduction of wages, or failure to make advances in wages that otherwise would be made. In other words, in most businesses it will inevitably be levied at the expense of employment and wages, and labor will pay it. From every standpoint it would be expedient to postpone taxing pay rolls, if they are to be taxed at all, until there is an increase of gross earnings in most kinds of business. The time to provide funds for security will be when gross earnings are large enough to enable busi-

ness to provide them without reducing employment or curtailing wages.

Putting Labor on Useful Work

The problem of providing work relief is made much more difficult by theorists and professional humanitarians than it need be. There is a vast amount of useful work that needs to be done in the country. There is much of this useful work that can be done only by the government and, especially, the state and local governments. All work relief money should be spent upon such useful work as building sewerage systems, repairing pavements, eliminating grade crossings and so on. It is sheer waste of the taxpayers' money to spend it for useless work when so much useful work needs to be done. The wages paid for work relief should, in every case, be less than the wages paid in private business in the same communities for similar work. The problem of reemployment is that of increasing employment in private business, and there should be a sufficient differential between wages for work relief and work for private industry to give every person on work relief an incentive to accept any employment offered in private businees.

Useful Work on the Railroads

The greatest volume of useful work that needs to be done is in the railroad and construction industries. Congress has under consideration transportation legislation recommended by Co-Ordinator Eastman which would increase the earning and spending power of the railroads, and it is to be hoped that it will not be delayed and blocked by the consideration of programs for reform and security intended to prevent or ameliorate the next depression. There is also under consideration legislation which would increase the loans that could be made to the railroads. The loans contemplated would be made not only to save railways with proved and prospective earning power from trusteeship, but also to enable the railways generally to increase their buying of equipment, materials and supplies. The railroads need much new equipment, especially of improved types. They need to increase their expenditures for maintenance. There would be no substantial difference in financing their purchases of equipment by the sale of equipment trust certificates to the government and the sale of them to private investors. They would make the same additions to and deductions from capital account in either case.

Expenditures upon their permanent structures are charged partly to capital account and partly to maintenance. Maintenance is an operating expense, and under conditions remotely approaching normal it would be bad practice to borrow money to spend on maintenance. But present conditions are far from normal. There is much maintenance work that needs to be done and for which current earnings are inadequate. Railroad expenditures for needed equipment and maintenance will be for useful work. They will be for work that must be done and paid for some time. There is no means by which useful work that will promote recovery can be better provided than by railroad expenditures for equipment and maintenance; and the railroads should take their chances on the future, and spend whatever money the government is willing to provide.

"Do First Things First"

Railroad expenditures, like all expenditures to increase employment and promote recovery, should be reasonable. They would not be reasonable if made at hourly wages increased 33⅓ per cent by the establishment of a six-hour day at eight-hours' pay. It is open to serious question whether they would be reasonable at wages restored, as they will be on April 1, to the highest prosperity level that ever prevailed in history.

The transportation problem is among the most important of the problems of recovery. The consideration of it should not be subordinated and postponed by the consideration of problems relative to what should be done about the next depression. Unless the problems of the present are more rapidly solved, efforts now being made to solve the problems of the future may prove to have been an entire waste of time and energy.

Lighter Materials and Lower Operating Costs

For many years much thought and study have been given to the possibilities of reducing the weight, per unit of capacity, of cars and locomotives, primarily for the purpose of cutting down the costs of transportation. Steadily, and particularly over the past three decades, improvements in materials have made it possible both to simplify the construction and to strengthen critical parts in order better to withstand the increasingly severe conditions to which they have been subjected.

As a typical illustration, the art of making steel castings has been vastly improved since the beginning of the present century, and this, with an equally impressive betterment in the physical properties of the steel, has resulted in a product almost beyond the imagination of the railway equipment designer of three decades ago. It is true that the extensive use of such castings has made it possible, to a certain extent, to stem the tide of rising weights per unit of capacity. Possibly the greatest gain, however, is due to the smaller number of parts required to replace built-up structures and in greater durability, both of which factors have made possible lower maintenance costs and greater reliability of service.

It would take too long and require too much space to attempt to catalog the innumerable variety of appli-

cations of improved materials to railway equipment, from the smallest details of such refinements as the air brake control to the large and bulky parts of cars and locomotives.

In spite of these improvements, however, the insistent demands for greater power, greater capacity, and greater reliability, as economic conditions have forced us to go to longer and longer trains and higher and higher speeds, have intensified the severity of the service to which the equipment has been subjected to such an extent that the tendency has been to increase rather than decrease the weight per unit of capacity. In passenger cars also the demands for greater refinements in the interest of safety, comfort and convenience of the traveling public have forced an increase in the weight of the equipment per passenger. The past year or two has witnessed experiments on a large scale in the use of special materials in railway equipment, which promise to have a profound effect in reducing weights, and in turn cutting down the costs of operation.

In passenger service the development of the rail motor car was retarded by the difficulty in providing power units of sufficient size to propel the cars. It is true that steadily over the years the size of these power units has been increased; fortunately there has been unusual progress in this respect during the past year or two. The widely heralded high-speed articulated streamlined trains driven by internal combustion motors were made possible only by radical improvements in this respect and by the introduction of aluminum alloy and stainless steels. Regardless of the extent to which such trains may be used in the future, the pioneering in their introduction and in the application of the special materials of which they are composed, has focused the spotlight dramatically on the possibility of making use of such materials on a large scale in the construction of railway equipment.

Experience with special materials and internal combustion motors in airplane and automobile construction has apparently done much to break through the natural conservatism of the designer and operator of railway equipment. This was forcefully impressed upon those who attended the February meeting of the New York Railroad Club, when recent trends in both freight and passenger train equipment were illustrated and described by engineers of both the railroads and the car builders. Not the least striking of these improvements is the use of special materials in tank cars, thus making it possible for the railroads to retain or regain business which otherwise would be lost.

Incidentally, critics in the smoking compartments of Pullman cars, who dogmatically criticize railroad managements for conservatism and lack of imagination for not earlier introducing these types of equipment, can be effectively silenced when they learn how recently some of these materials have become available.

It will be a nice problem to determine, on a sound economic basis, just how far some of these more expensive materials and devices can be used. Will it pay better to go to the extremes in this respect, or are there intermediate materials and less expensive equipment which will give a substantial advantage as compared to the present standard practices, and the lower first cost of which may offset the lower operating costs made possible by the more expensive construction? Fortunately attention is being concentrated upon this problem and new equipment is being ordered in sufficient quantities, and will be operated under such a wide variety of conditions, so that within a reasonable time data should be available upon which to arrive at reasonably sound conclusions.

Equality of Regulation Would Benefit All Forms of Transportation

The opinion is prevalent that the demand for regulatory legislation to cover all transportation agencies originates solely with the railroads.

This might be the case if it were not for the fact that unrestrained competition among the water and highway carriers has resulted in these agencies generally falling far short of earning an adequate return, even during years of national prosperity. True, by reducing rates they have been able to take business from the railroads; but at the same time, in their endeavor to take business from each other, they have so demoralized the rate structure that their financial condition is generally deplorable and this, particularly in the case of water carriers, prevents the replacement of the existing equipment which in many instances is already obsolete and inefficient.

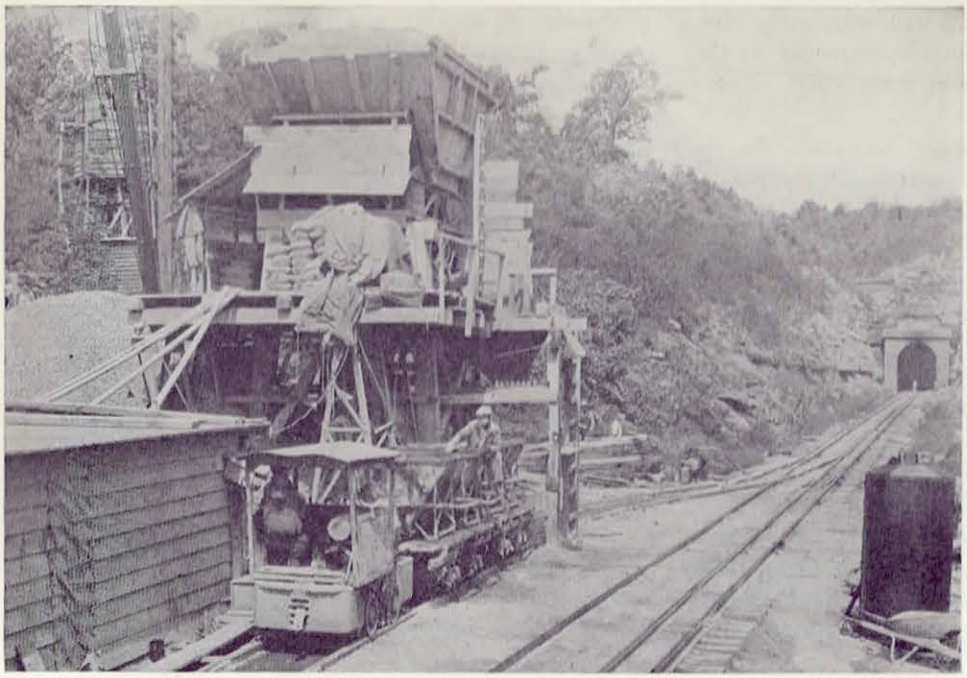
In the case of many water carriers, this condition persists despite substantial government aid, either direct or in the form of sale of war-built ships at a small fraction of their replacement cost. Because of this situation, it is not surprising to find a decided change in the attitude of the principal water carriers in favor of the legislation.

One can have little patience with the plea that the railroad must be protected from its competitors, thereby preventing the public from securing the benefit of new and more convenient forms of transportation. But who would consider it a sporting spectacle to see a champion in a strait-jacket being beaten to his knees by a group of combatants with the free use of both their arms and their legs.

The public interest requires competition to the end that each form of transportation may find its useful place in carrying the nation's business. The same conditions exist today in the newer forms of transportation that existed in 1887 and led to the first railroad Act; namely, discrimination between shippers and destructive competition in rates.

Whatever regulation and supervision is necessary in the public interest must be extended in similar manner over all forms of transport. Each form must be given a fair chance to compete on an equal basis and expand its service through technological development. A healthy condition cannot exist when the railroads are bound to relatively rigid rates while competitors are free to skim the cream. The same is true as to other practices.

W. Averell Harriman in the February 23 "Today"



The Laying of a Third Rail Provided the Necessary Narrow-Gage Track for the Delivery of the Concrete from the Mixer Plant to the Tunnel

Excellent Plant Expedites Tunnel Lining on Illinois Central

Project on Edgewood cutoff completed with PWA funds after suspension of contract work

ON December 1, the Illinois Central completed the first of three improvement projects for which funds had been provided earlier in the year in the form of loans from the Public Works Administration. This project comprised the completion of a concrete lining for a tunnel a half mile long on the Edgewood cutoff near Reevesville, Ill. This work was carried out by company forces, as required under the terms of the federal loan, but the commendable record of progress made was due in no small part to the excellent plant leased from the construction company that had prosecuted work on the tunnel lining during 1933, until the railroad was compelled to call for a suspension of operations because of lack of funds.

The Edgewood cutoff, completed early in 1928, comprises an alternate single-track line 168 miles long between Edgewood, Ill., and Fulton, Ky. It was built to relieve congestion on the old route through Cairo, Ill., which is 22 miles longer and embraces ruling grades as heavy as 0.8 per cent, whereas, the newer line was constructed with no grades in excess of 0.3 per cent.

The Reevesville tunnel is one of three that were required on that part of the Edgewood line that traverses the broken country north of Metropolis, Ill., that is known locally as the Illinois "Ozarks." It pierces a formation of thin laminations of shale that is of such a nature as to have required the lining of the tunnel during its construction. This lining consisted of 12-in. by 12-in. timber sets with a five-segment arch, spaced four feet center to center and lagged with 4-in. by 6-in. pieces. This lining extended a total length of 2,574½ ft., or all of the tunnel except a total of 49 ft. of concrete lining at the two portals. The shattering caused by blasting during construction and subsequent softening of the shale imposed loads on the lining which, in some sections of the tunnel, were sufficient to produce distortion of the arches and in some places was sufficiently serious to require the placing of supplemental sets between the original ones. However, as this plan proved unduly expensive it was discontinued and, instead, the weakened arches were reinforced by inner rings of timber. This could be done without encroaching on the operating clearance, as the original lining had been constructed with a view to the eventual placing of a concrete lining.

Permanent Lining Necessary

However, in spite of this repair work a serious overbreak occurred in 1932, that brought down considerable of the roof for a length of 40 ft., and required the construction of A-frames to support packing at an elevation of as much as 12 ft. above the arches. These experiences, together with the weakening of the timbers throughout the lining as a result of progressive decay, led to the decision to line the tunnel with concrete, and a contract was awarded to the Bates & Rogers Construction Company, Chicago, in the summer of 1933 for 1,016 track feet of lining, to be placed in those portions of the tun-

nel that offered the most serious concern. This work was started on August 22 and continued until December 22, when financial considerations required the railroad to order a suspension of operations. As only 690 ft. of the lining had been completed, and it was hoped that the work could be resumed without any protracted delay, the contractor left his entire plant at the site.

Subsequently, the railroad was successful in obtaining an allotment of $215,000 from the PWA loan fund to cover the cost of completing the lining, but with the stipulation that the work would have to be done solely by railroad employees or with men obtained from the United States Employment Service. The methods followed when work was resumed conformed substantially with the plan originally adopted, and as a result no distinction is made between the contract and "company" work in the following exposition.

Dimensions of the Lining

The tunnel, as lined, has a clear width of 17 ft. 6 in. between side walls and a height at the crown of 22 ft. 2½ in. above top of rail. The side walls are vertical to a point about 11 ft. above top of rail, above which elevation they batter inward so that they are 19½ in. closer together at the spring line of the arch. This is indicated on the drawing, which also shows the reinforcing. Five weep holes, formed by casting three-inch pipe in the concrete lining, were provided every 15 ft., namely, one at the crown, two at the spring line and two near the bottoms of the walls. In addition, six-inch weep holes were provided through the footings, originally at 75 ft. intervals, although subsequently this spacing was reduced to 50 ft.

Preliminary to the placing of the permanent lining, further work had to be done on the old one. As the plans specified that the inner face of the concrete must clear the face of the old timber sets 9 in. on the sides and 18 in. at the crown, it was necessary to dress off the timbers of any sets that were so distorted as to encroach on this clearance and to remove the reinforcing rings that had been placed inside some of the sets. To do this and to reinforce other sets of questionable safety 120 steel sets, constructed of 8-in. H-column sections, were applied in pairs, one on each side of the weak timber sets. And as the locations where these were applied were almost invariably places of distortion in the lining, these steel sets were fabricated to field measurements and marked for erection in particular locations. This work was done from a flat-car-mounted scaffold.

Methods of Bracing

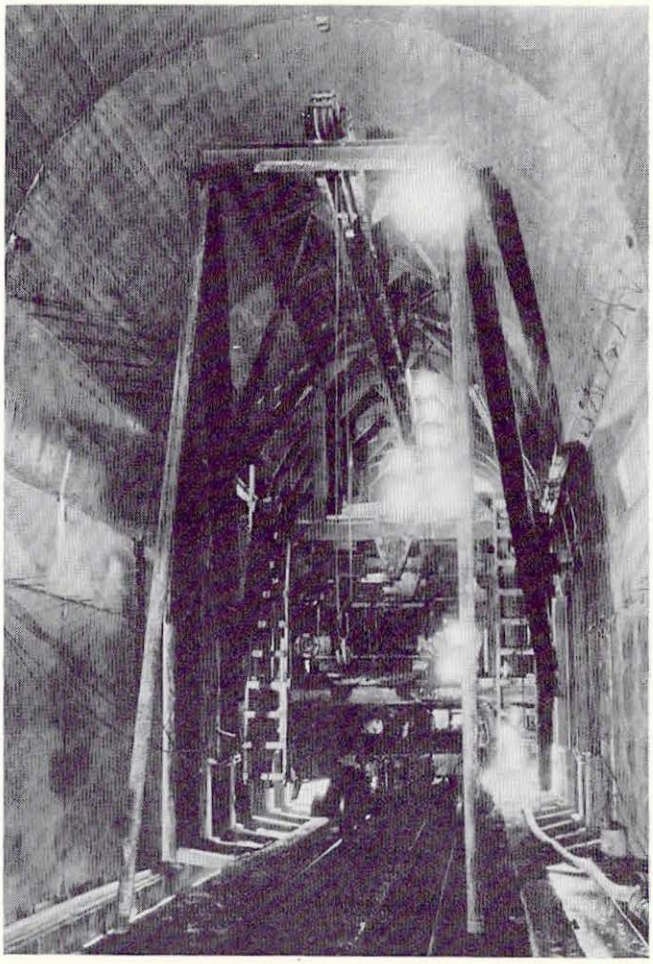
Another preliminary task that also involved the old lining, was the excavation for and the concreting of the side-wall footings. Owing to the conditions imposed in driving the tunnel, the 12-in. by 12-in. sills under the old posts were placed in four-foot lengths, one centered under each post, and were, therefore, of no value in supporting the posts while excavation for the footings was carried on underneath them. Furthermore, blocking was out of the question because of the depth of the excavation—to as much as 6 or 8 ft. below base of rail. This predicament was overcome by cutting a gain in the faces of the posts just wide enough and deep enough to receive a 15-in. steel channel placed lengthwise of the tunnel, with its web vertical. This channel served as a beam to support any post from the adjacent posts while its support was being undermined temporarily for the footing work.

Experience in this work also disclosed a tendency for the posts to kick in at the bottom. To prevent this, 12-in. by 12-in. timbers were laid along the ends of the ties. Struts were introduced between the posts and these timbers, and wedges were applied between the timbers and those ties that were in line with the posts. To minimize the transmission of vibration from the track through this strut system to the tunnel lining, the tie plates were removed from the ties that served as struts. This same system of struts was employed also to brace the bottoms of the forms used in concreting the side walls of the lining.

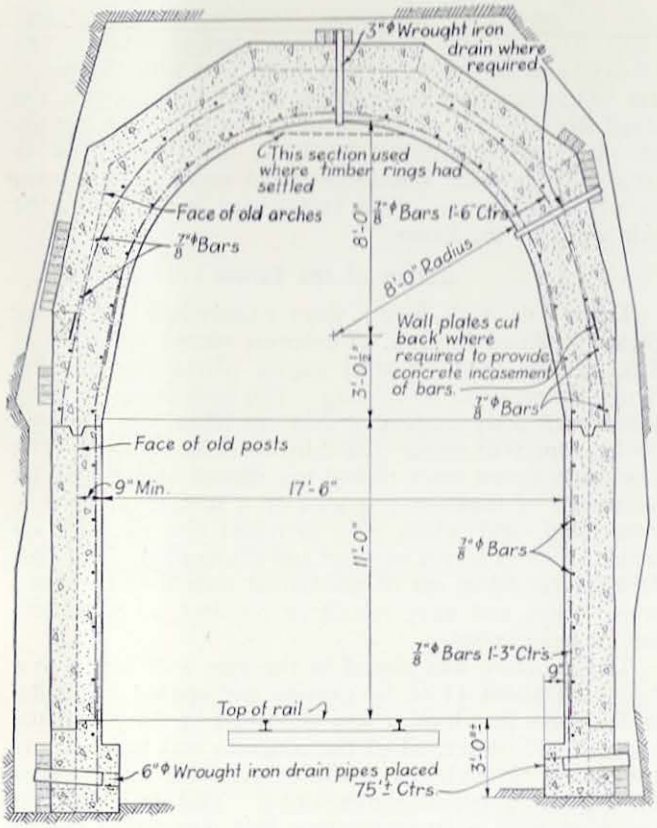
Details of the Forms

These side wall forms were constructed of 7/16-in. plates stiffened by 8-in. H-columns placed vertically at 5-ft. centers, and by steel angles placed horizontally. These forms were 30 ft. long. The arch forms were of wood with 3-ply centers of 2-in. by 12-in. plank spaced 30 in. center to center and 2-in. by 6-in. lagging. The steel side forms were picked up, moved ahead, and set by means of facilities provided on a special car used in concreting, and which also provided the platform on which the arch forms were set and dismantled. The arch forms were taken out of the tunnel each time that they were struck and were rebuilt or repaired by carpenters before being reset.

The concrete was placed in the side wall forms to a height of about 11 ft. by gravity and spaded manually, while above that level it was deposited by the pneumatic process. However, all of the concrete was handled into the forms through the facilities provided on the concreting car previously mentioned. This is a flat car provided with a superstructure that supports a second floor or platform at a level of about 8½ ft. above the



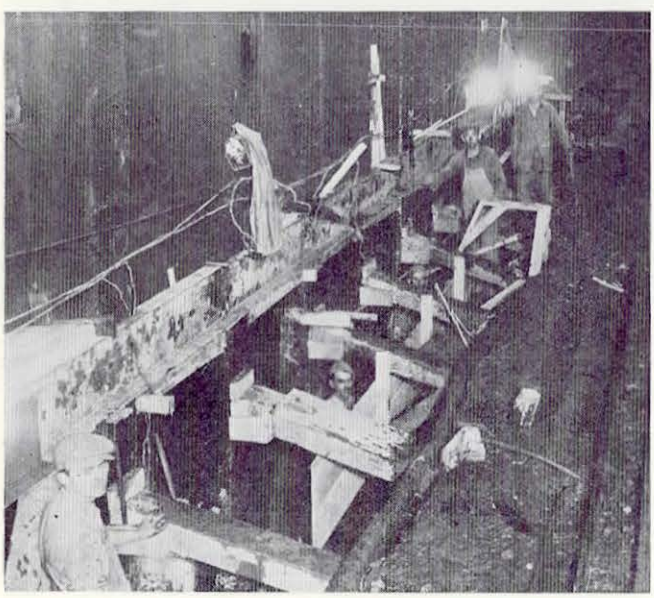
Front View of the Concreting Car, Showing the Cantilevered Runway and Trolley Hoist Used in Picking Up the Concrete Buckets


3"ϕ Wrought iron drain where required
This section used where timber rings had settled
Face of old arches
7/8"ϕ Bars
7/8"ϕ Bars 1'-6" Ctrs
8'-0" Radius
Wall plates cut back where required to provide concrete incasement of bars.
7/8"ϕ Bars
Face of old posts
9" Min.
17'-6"
11'-0"
7/8"ϕ Bars
7/8"ϕ Bars 1'-3" Ctrs
Top of rail
6"ϕ Wrought iron drain pipes placed 75'± Ctrs

Typical Cross-Section of the Tunnel Lining

car floor and also carries a steel trolley runway over the longitudinal centerline at a level of about 20 ft. above top of rail. This runway was cantilevered about 19 ft. beyond one end of the car, but provision is made for supporting its outer end on legs from the tunnel floor when the car is stationary.

This trolley runway has two functions. It served as a convenient means of supporting the arch centers when they were being returned to the tunnel, but its main purpose was to provide the facility for transporting concrete buckets from narrow-gage cars, spotted under the cantilevered extension, to the upper platform of the concrete car. The trolley was operated by means of a steam winch located on the lower platform of the car but employing compressed air instead of steam.



How the Side-Wall Posts Were Supported by a Steel Channel and Strutted While the Footing Excavation Work Was in Progress

Handling the Concrete

Concrete buckets, upon being delivered to the upper platform of the car, were dumped either into a hopper located about midway of the length of the car, or into one of two shoveling aprons placed about 10 ft. apart along the center line of the car, one on each side of the hopper. From the hopper the concrete passed into a Ransome ½ yd. hydraulic delivery gun whence it was shot through a 6-in. delivery pipe to the arch forms. The end section of this pipe was connected by means of a Barco flexible joint so that it could be swung in distributing the concrete to the crown or toward either spring line of the arch.

When concrete was being placed manually in the side-wall forms, the car was spotted so that the two dumping aprons were directly opposite two doors in the forms on each side, and wide chutes, extended from these aprons, permitted the concrete to be shoveled or pushed directly into the forms. Twelve men were employed in this operation, in addition to the trolley hoist operator. Four men were employed inside of each form to spade the concrete into place, while four other men, working in pairs, shoveled the concrete into the two forms, moving from one apron to the other as the concrete was dumped alternately on one and the other.

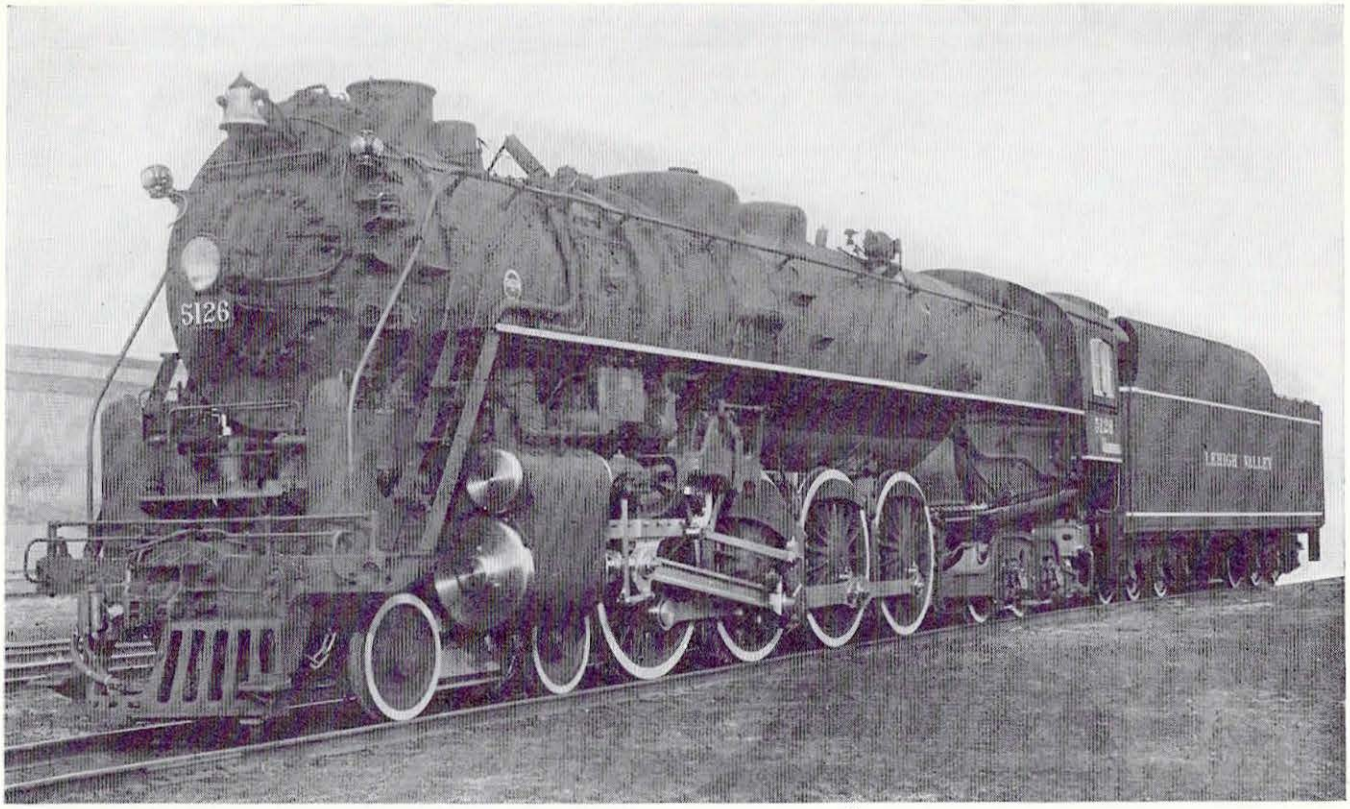
Mounted in the superstructure of the car at two points in its length were pairs of 8-in. I-beams placed transversely end to end, with a small hydraulic jack between their inner ends by means of which they could be pushed out beyond the sides of the car or retracted. Screw jacks mounted on top of these beams at their outer ends were brought to bearing on the underside of brackets attached to the side-wall forms and served as the means of lifting the forms for moving them from one position to another.

The concreting car was moved by a 16-ton gasoline operated Vulcan locomotive, another of these being employed to handle the lining repair car and to haul spoil from the footing excavation. Concrete was delivered to the car in ¾ yd. Insley bottom-dump buckets mounted on 3-ft. gage cars which were moved in two-car trains by 4-ton Whitcomb gasoline locomotives. Two of these trains were provided so that one train could be loaded at the mixer while the other moved into the tunnel for unloading and returned. In addition to the "dinky" operators, a single switchman was employed to hook the buckets to the unloading hoist on the concreting car and to throw the switch to clear the loaded train at the mixer.

The efficiency with which the work in the tunnel was conducted was due in large part to the excellence of the supporting plant provided at the south portal. The concrete was mixed in a ½ yd. Smith mixer mounted on a platform of sufficient height to discharge by gravity into the car-mounted buckets, and surmounted by an aggregate bin equipped with Johnson batchers. This bin was filled by a clamshell bucket on a guy derrick, either direct from cars or from storage piles, while the cement was hoisted to the mixer platform by piling the sacks on a rope sling which was looped over the clamshell. Water was delivered to the job from the water station at Reevesville, in two 9,000-gal. locomotive tenders that were placed on a spur track while the water was pumped into a 10,000-gal. tank that was erected on the hillside to provide gravity delivery.

The compressed air for the operation of the concrete delivery machine and other work was provided by a

(*Continued on page 296*)



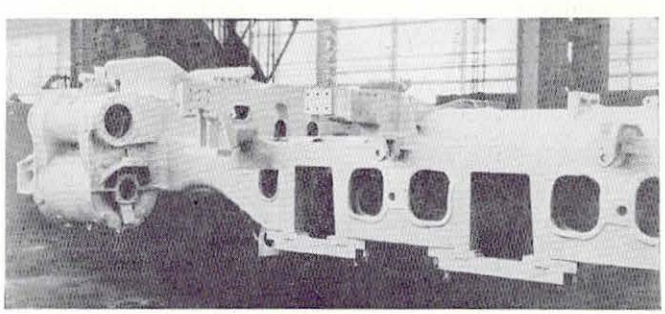
Lehigh Valley 4-8-4 Type General Service Locomotive Built by Baldwin Locomotive Works

Lehigh Valley Acquires Five More 4-8-4 Type Locomotives

New locomotives supplement 22 of same general type purchased in 1931 and 1932—Will be used for either fast freight or heavy passenger service

AFTER a thorough investigation as to the type of motor power best suited to handle fast freight movements between Buffalo and tidewater the Lehigh Valley drew up a specified time schedule for the movement of a 3,000-ton train and early in 1931 placed orders for two sample locomotives, one each with the Baldwin Locomotive Works and with the American Locomotive Company. In details of design the builders were given considerable freedom. The specified schedule allowed 3 hours for the 90 miles from Buffalo to Manchester and 3 hours for the 89 miles from Manchester to Sayre; 2 hr. 15 min. for the 85 miles from Sayre to Coxton; 1 hr. 30 min. for the 21 miles from Coxton to Gracedale (with one 2-10-2 type helper locomotive), and the same time for the 41 miles from Gracedale to Mahoning; then 3 hr. 15 min. for the 107 miles from Mahoning to Newark. From Newark to Oak Island (Jersey City) the final movement is a switching one.

A general description of the two sample locomotives, No. 5100, road class T-1, and No. 5200, road class T-2, was given in the *Railway Age*, April 4, 1931, page 669. Following receipt of the two locomotives they were submitted to full road and dynamometer tests, the results of which were given quite fully in the *Railway Age*,



Front Part of the Cast-Steel Bed for Lehigh Valley 4-8-4 Type Locomotives—It Includes Air Reservoir and Cylinders with Integral Back Heads

March 19, 1932, page 469. Both locomotives satisfactorily handled trains somewhat in excess of the specified 3,000 tons and in less than the time called for. Tests showed indicated horsepowers as high as 4,100, drawbar horsepowers up to 3,865 at about 35 m.p.h., and an average mechanical efficiency of about 92 per cent.

At the time these tests were conducted fast freight trains were being handled by 4-6-2 type locomotives, class K-5½, and by 2-8-2 type locomotives, class N5. The Pacifics weighed 311,900 lb. with 204,560 lb. on the drivers, 48,723 lb. rated tractive force, 27-in. by 28-in. cylinders, 73-in. drivers, 205 lb. boiler pressure, 4,118 sq. ft. evaporative heating surface, and 980 sq. ft. superheating surface. The Mikados weighed 325,000 lb., with 239,000 lb. on the drivers, 63,000 lb. rated tractive force, 27-in. by 32-in. cylinders, 63-in. drivers, 200 lb. boiler pressure, 4,009 sq. ft. evaporative heating surface, and 1,074 sq. ft. superheating surface. The Mikados were also equipped with boosters having a tractive force of 11,000 lb. Based on the results of the tests referred to it was estimated that the new locomotives in comparison with the older Mikado locomotives would show an increase in yearly revenue of $80,000 per locomotive.

In view of the satisfactory performance of the sample locomotives an additional order for 10 more locomotives was given to each of the two builders and delivery was made in the spring of 1932. Practically no changes were made in the designs of these locomotives but somewhat larger tenders were specified. While the two sample locomotives had tenders with a capacity for 18,000 gallons of water and 28 tons of coal, subsequent locomotives were furnished with tenders having a capacity for 20,000 gallons of water and 30 tons of coal.

Table I—General Comparison of Lehigh Valley 4-8-4 Type Locomotives

Road class	T-1	T-2	T-3
Road number	5101	5201	5126
Builder	Baldwin	American	Baldwin
Weight, engine, lb.	413,170	424,000	435,000
Weight on drivers, lb.	270,000	269,000	272,200
Rated tractive force, engine, lb.	66,400	66,700	66,500
Tractive force, aux. loco., lb.	18,360	18,360	.....
Cylinders	27 in. by 30 in.	26 in. by 32 in.	27 in. by 30 in.
Drivers	70	70	77
Steam pressure, lb.	250	255	275
Heating surfaces, sq. ft.:			
Firebox, complete	490	508	507
Tubes and flues	4,932	4,933	4,932
Evaporative	5,422	5,441	5,439
Superheating	2,256	2,243	2,056
Grate area, sq. ft.	88	88.3	96.5

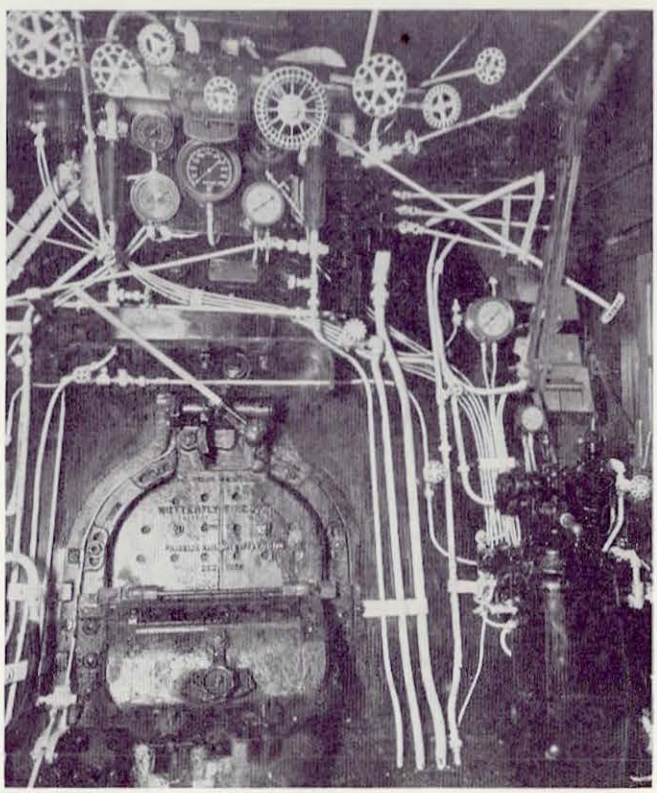
New Class T-3 Locomotives

The latest addition to the motive power equipment of the Lehigh Valley, delivery of which is now being made, consists of five more locomotives of the 4-8-4 type built by the Baldwin Locomotive Works. These are designated as class T-3 and are numbered 5125 to 5129. They are intended for service in either fast freight or passenger runs between Jersey City, N. J., and Buffalo, N. Y., and in design are a development of the previous class T-1 and T-2 engines. A general comparison of the leading weights and dimensions of the three classes is given in one of the tables. In the class T-3 the diameter of the drivers was increased from 70 in. to 77 in. and the boiler pressure raised from 250 to 275 lb. As a result the rated tractive force has remained practically constant, while the proportions make the new locomotives better adapted for still greater speeds in harmony with the traffic demands of the times. The firebox was made a foot longer, weights were somewhat increased and wheel bases extended.

Lehigh Valley locomotives for through service are restricted to a stack height of 16 ft., a width of 11 ft., must operate on 1½ per cent grades and 18 deg. curves.

Boilers and Accessories

The boilers are constructed of nickel steel sheets for both shell and firebox which were furnished by the Bethlehem Steel Company. The firebox crown and side sheets are in three pieces, which, in addition to the door sheet, throat sheet, flue sheet and combustion chamber, are completely welded. The firebox is fitted with three Thermic syphons on which the brick arch is carried, and an additional syphon is located in the combustion chamber which is 48 in. long. The firebox is 144⅜ in. long and 96¼ in. wide, thus providing a grate area of 96.5 sq. ft. The grates are of the Firebar type



Right-Hand Side of Back Boiler Head in the Cab of Lehigh Valley Locomotive

and the coal is fed by a Standard Type BK stoker with a cast-steel trough on the tender. The superheater is a Type E, having 2,056 sq. ft. of surface.

A Worthington feedwater heater, type 5-S-A, is used. For supplementary boiler feeding there is a Hancock non-lifting injector, type LNL. The check valves are located on top of the boiler near the front end.

The three Consolidated safety valves are located a short distance back of the dome and are attached directly to the boiler shell which is reinforced at this point. The whistle is mounted on the side of the smokebox in an inclined position. The whistle, drifting valve and blower valve are operated by superheated steam. The blow-off valve and muffler are of the Wilson type.

Foundation and Running Gear

The locomotive is built on a one-piece cast-steel bed, furnished by the General Steel Castings Corporation. It includes the cylinders with integral back heads, air reservoir and various brackets, including those for the air compressors on the front deck. Its shipping weight

is approximately 66,500 lb. Pilots were not fitted on class T-1 and T-2 locomotives, but have been placed on the new class T-3 locomotives. The engine coupler is counter-balanced and pivoted so that it can swing down into the cast-steel pilot. All drivers and the trailing truck are equalized together with a transverse lever back of the rear drivers which is connected to the trailer-truck equalizers. Franklin lateral motion driving boxes are applied on the second pair of drivers to reduce the rigid wheel base and permit of passing through sharp curves.

A Detroit mechanical lubricator is connected by feed pipes to the cylinders, valves, guides, stoker, driving-wheel hubs, trailing-wheel hubs, throttle-valve and drifting-valve riggings, headlight generator and stoker trough on the tender. A Bosch lubricator is applied for the air compressors. Fittings are also provided for pressure grease lubrication.

Table II—Principal Dimensions and Weights of the Lehigh Valley 4-8-4 Type Locomotives, Class T-3

Railroad	Lehigh Valley
Builder	Baldwin Loco. Works
Road Nos.	5125-5129
Road class	T-3
Type of locomotive	4-8-4
Service	Freight and passenger
Rated tractive force	66,500 lb.
Factor of adhesion	4.09
Cylinders, diameter and stroke	2—27 in. by 30 in.
Valve gear, type	Baker
Valves, piston type:	
Size	12 in.
Maximum travel	8⅝ in.
Cut-off in full gear, per cent	82½
Weights in working order:	
On drivers	272,200 lb.
On front truck	73,700 lb.
On trailing truck	89,100 lb.
Total engine	435,000 lb.
Tender	389,000 lb.
Wheel bases:	
Driving	20 ft. 0 in.
Rigid	13 ft. 4 in.
Total engine	45 ft. 11 in.
Total engine and tender	95 ft. 2 in.
Wheels, diameter outside tires:	
Driving	77 in.
Front truck	36 in.
Trailing truck	42 in.
Boiler:	
Type	Conical
Steam pressure	275 lb.
Fuel	Soft coal
Diameter, first ring, inside	86⅜ in.
Firebox, length and width	144⅜ in. by 96¼ in.
Combustion chamber, length	48 in.
Tubes, number and diameter	77—2¼ in.
Flues, number and diameter	202—3½ in.
Length over tube sheets	21 ft. 6 in.
Grate, type	Firebar
Grate area	96.5 sq. ft.
Heating surfaces:	
Firebox and comb. chamber	364 sq. ft.
Syphons	143 sq. ft.
Firebox, total	507 sq. ft.
Tubes and flues	4,932 sq. ft.
Total evaporative	5,439 sq. ft.
Superheating	2,056 sq. ft.
Comb. evaporative and superheating	7,495 sq. ft.
Special equipment:	
Superheater	Elesco Type E
Feedwater heater	Worthington—5SA
Stoker	Standard—BK
Syphons, Thermic	4
Tender:	
Style	Rectangular W. B.
Water capacity	20,000 gal.
Fuel capacity	30 tons
Trucks	6-wheel

The valve gear is of the Baker long-travel type and provides movement to 12-in. piston valves having a maximum travel of 8⅝ in. A Franklin power reverse gear is carried on a bracket mounted on the bed casting and thus is free from the boiler. Control is by means of a Bradford front-end throttle valve furnished by the American Throttle Company. Lunkenheimer drifting valves and Walworth cylinder relief valves are used. The crossheads are of the Laird multiple-ledge type.

The brakes are of the new 8-ET type furnished by the Westinghouse Air Brake Company. The locomotives are also equipped with automatic train control furnished by the General Railway Signal Company.

The tenders, which are mounted on water-bottom cast-steel underframes, have a capacity for 20,000 gallons of water and 30 tons of soft coal. They are carried on six-wheel trucks furnished by the General Steel Castings Corporation. The trucks have clasp brakes furnished by the American Steel Foundries.

One of the tables gives the general dimensions and weights of these locomotives.

What is the Best Way To Light Passenger Cars?

By H. H. Helmbright and Frank B. Lee*

THE American railroads are to be commended on their recent efforts to increase passenger travel by means of radical changes in car design and equipment. Directly and indirectly, air conditioning, comfortable reclining seats, more cheerful and pleasing interiors, and other features are enticing the traveling public from competing forms of transportation. Faster schedules are doing likewise. Apparently the question of lighting is slowly receiving the attention it deserves. However, in some recently built equipment there is reason to suspect that certain fundamental principles necessary to good illumination design have not been give sufficient consideration.

Illumination vs. Tricky Lighting

Totally indirect lighting has always been considered an ideal system. As far as eye comfort is involved this probably still holds true. Therefore the railway car designers, in their effort to give the passenger the best available, have selected indirect lighting as the final answer to the car lighting problem. However, more thought has apparently been given to unique methods of concealing the lamps themselves or in providing some sort of cove or lighting trough arrangement different from that used by competitors in similar car equipment, than to such elements of good lighting as adequate intensity, proper contrast between adjacent lighted surfaces, correct distribution of the light, and efficient use of the total light flux of the lamps themselves.

From the sidelines it appears to the illuminating engineer that air conditioning and architectural features of car design are definitely decided upon without giving serious consideration to the incorporation of an efficient type of lighting in the car construction. The final execution has in most instances, been unique but might be considered quite inefficient, somewhat impracticable from the maintenance standpoint, and unsatisfactory where the resulting quantity of illumination delivered at the reading plane is concerned.

There exists, for some unknown reason, the belief that the use of totally indirect lighting materially reduces the quantity of light necessary on the reading plane for comfortable reading as compared to that required if

* Railway Lighting, General Electric Company

lighting of the direct or semi-indirect type was to be used. This could be true only where the direct or semi-indirect lighting system is of poor design and produces annoying glare, either due to excessive brightness of the visible light source or from the contrast in brightness between two or more surfaces within the angle of normal vision.

No Power to Waste

There is reason to question the advisability of the use of totally indirect lighting in railway passenger car equipment due to the apparent limitation placed on capacity of batteries and generator equipment. The lower efficiency of indirect lighting systems, as well as their tendency to accumulate dust which is difficult to remove and thus further impairs the efficiency, makes it appear unsuitable for railway use. In fact the semi-indirect or a well-designed direct lighting system with a minimum of glare but producing foot-candle intensities on the reading plane of 10 to 20 foot-candles appears to represent a more practicable or rational solution to the problem of car lighting. The theoretical ideal diffusion of light from the totally indirect system might well be sacrificed slightly in order to obtain illumination values sufficient to allow reading without the strain resulting in eye fatigue induced by intensities considerably below 10 foot-candles.

The traveling public in the past has continually complained because of inadequate lighting of railway cars where foot-candle values ranged from 2 to 4 foot-candles. It is, therefore, disappointing to find that recently built streamline trains, lighted by means of indirect lighting, furnish foot-candle values of this same order, yet approximately four times the lamp wattage has been used. Although some of the harmful and annoying glare has been removed the task of seeing has been aided very little, if at all.

Higher Intensities for Moving Objects

It is obvious that the designers of recently built equipment intended to provide adequate light for comfortable seeing, but failed to appreciate or lacked the knowledge of the inefficiency of indirect lighting or were not acquainted with the values of illumination necessary for comfortable and adequate seeing. Also very little, if any, consideration was given to the vibration conditions to which the passenger is subjected during the time he attempts to read on the average railway car. Illumination values permitting comfortable reading in an easy chair at home where vibration is absent certainly are unsatisfactory for the railway car where the reading matter as well as the reader are more or less in motion.

Elaborate and extensive tests covering a period of years and involving hundreds of subjects have established actual illumination values necessary to comfortable or adequate seeing or in this instance comfortable reading. The 10—20 foot-candles mentioned above approximate these intensities and should be the basis for the design of railway car lighting installations. Furthermore, calculations should provide for a rather large factor of depreciation for railway service in spite of the fact that air-conditioned car equipment is expected to eliminate dust and dirt. Direct lighting and indirect lighting installations suffer greatly regardless of whether or not air-conditioning is available because it is practically impossible to restore the original efficiency of an existing lighting installation, particularly one of the totally indirect type, merely by wiping the accumulated dust from the cove or lighting trough. It is usually necessary to renew painted surfaces as well.

Excellent Plant Expedites Tunnel Lining on Illinois Central

(*Continued from page 292*)

plant embracing two Chicago Pneumatic compressors and one Ingersoll-Rand compressor, the former having a capacity of 650 cu. ft. each and the latter 450 cu. ft. of free air per minute. All three were operated by Diesel engines. The air was delivered at a pressure of 120 lb. per sq. in., through a pipe line that was 5 in. in diameter for 2,500 ft., and 4½ in. for the remainder of the distance through the tunnel. This line, which was laid on the footing offset of one of the walls, was provided with plugged T-fittings at intervals for the convenient connection of a 3-in. hose lead to the concreting car.

The tunnel was lighted by electricity with current supplied by two 45-watt Kohler gasoline engine-generator sets, one of which was placed just outside of each portal. Lights were hung from the tunnel walls and in addition, outlets were provided for convenience in making connections to the lighting circuit on the concreting car at any spotting. Similarly, a telephone line was carried through the tunnel from a cabin at the north portal, connections being made from this line to the concrete car or the timber-lining repair car so that any crew at work in the tunnel could be reached at once by a conductor who was stationed in the cabin during working hours, and whose duty it was to see that the equipment cleared the tunnel in advance of the arrival of trains. It was necessary to do this from three to eight times during the eight-hour working shift. The average time lost per day in clearing the tunnel was an hour and a half; the minimum was about 45 min.

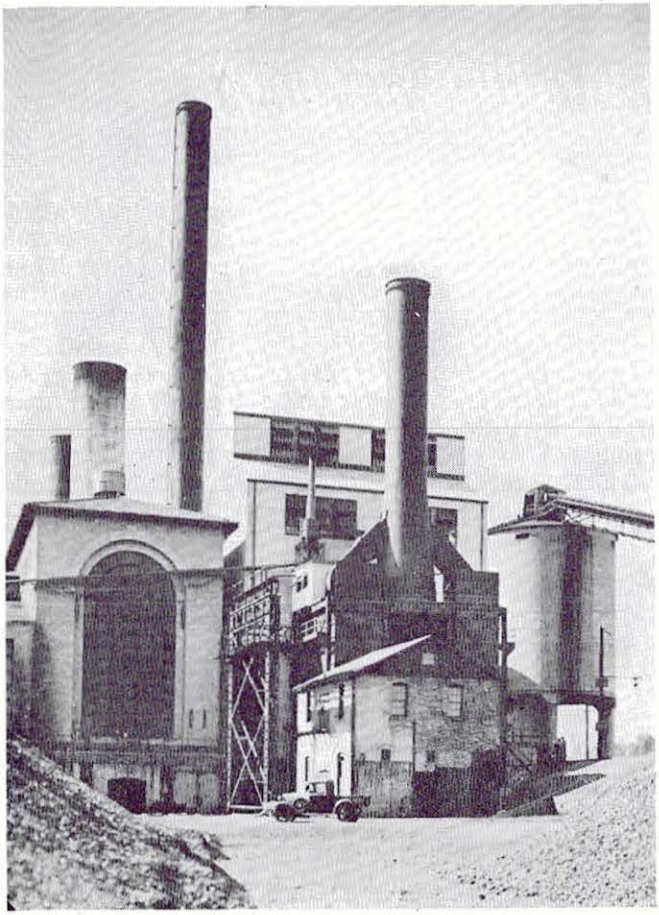
On account of the difference in the yardage and the relative difficulty in placing the concrete, it was possible to place the side-wall concrete in 30 ft. of forms in about the same time (about five hours) as was required to fill a 15-ft. length of the arch forms. For this reason, the work was scheduled so as to complete 30 ft. of side walls on one day and 15 ft. of arch on each of the two following days and then repeat the operation. Thus, it was possible to complete 60 ft. of tunnel lining in a 6-day week, and this schedule was maintained for 20 weeks. As the concreting operations on the walls and arches did not ordinarily occupy the entire working period, the remaining time was used in concreting the footings, and this plan made it possible to keep the footings completed well in advance of the lining work.

A special problem was imposed at the point in the tunnel where the overbreak occurred. To reduce the expense of filling the void outside the limits of the neat arch section at this point as well as to reduce the load, resort was had to a lean cinder concrete which was forced into this space until it was entirely filled except for a section four feet long between bulkheads that had been required to complete the backfill concrete in the space on either side. Arch centering was then completed beneath the remaining section and a three-inch pipe was installed in a vertical position at the crown, with its upper end just below the roof of the overbreak. Concrete was then forced in through this pipe to refusal and the pipe left in place to serve as a weep hole.

The force employed on the work averaged about 60 men, a somewhat greater number being required when the footing excavation was in progress. The work was planned and carried out under the general direction of C. C. Westfall, bridge engineer of the Illinois Central, assisted by J. H. Graham, assistant engineer.

Smokeless Combustion of Powdered Coal

New Haven disposes of smoke electrically at its Cos Cob, Conn., power plant



The New Boilers Are Served by the Precipitators and Stack at the Right—Photograph Was Taken with Boilers Working at Full-rated Load

ELECTROSTATIC fly-ash precipitators have been installed by the New Haven in the power plant which supplies a major part of the power used on its electrified lines between New York and New Haven, Conn. The plant is located at Cos Cob, Conn., on the Mianus river, near the load center of the electrical system and in a place adjacent to the restricted residential districts of Greenwich and Riverside, Conn. Because of the proximity of these districts, smoke prevention has always been given special consideration. Obsolescence made necessary, in 1934, the removal of several boilers installed in the original plant in 1906. These were replaced by two Bigelow-Hornsby-Combustion Engineering boilers having a capacity of 110,000 lb. of steam per hour burning powdered coal. The introduction of boilers having a high rating, and the use of pulverized coal, called for special measures to provide for the elimination of smoke and fly-ash. Cottrell electric precipitators, supplied by the Research Corporation, New York, were selected and installed for this purpose.

Precipitators Require Little Power

The precipitators consist essentially of riveted and welded steel shells, in which are placed a series of reinforced concrete plates, spaced ten inchs apart. These constitute negative electrodes. Midway between the plates are hung a series of vertical rods which are the positive electrodes. The flue gases pass between the plates and particles of ash and smoke are charged electrically and adhere to the negative electrodes. These fall off or may be scraped off into hoppers at the bottom of the enclosing shell from which they may be drawn for final disposal.

Direct current, at 75,000 volts, is used for the operation, this power being supplied by two transformers and two synchronous motor-driven rectifiers. The amount of power required is small, being approximately five kilowatt hours per million cubic feet of gas cleaned. The process removes practically all of the fly-ash in the flue gas.

One precipitator is installed for each of the two boilers, and dampers are arranged so that all of the flue gas may be passed through one unit while the other is being cleaned. The cleaning operation takes only a few minutes and consists merely of reducing the voltage while motor-driven scrapers are moved across the surface of the concrete plates. The scraping operation is required only for removing an excess of fly-ash deposit. The greater part of the ash collected falls into the hoppers after it has been stopped and built up to substantial quantities by the electrostatic field.

Plant Uses Low Grade Coal

The plant uses both low-grade slack and run-of-mine coal. In case the latter is used, it is first run through a crusher. Some of the coal used is taken from storage piles in a yard adjacent to the plant and some is taken directly from cars. The crusher is located between the storage yard and the receiving track. All of the coal passes up a belt conveyor under a separating magnet to remove any iron or steel, and into storage bins in the form of large concrete silos. From the silos the coal is weighed and carried by lorry cars and deposited in the boiler hoppers. From the hoppers it is fed by gravity to pulverizers which powder the coal and deliver it with the proper amount of air to the furnaces.

With the boilers working at full load, no visible smoke is emitted from the stack.

The engineering work required by the new boiler installation was done by Gibbs & Hill, consulting engineers, collaborating with the railroad's own mechanical and construction engineering forces.

High-Power Hand Brake

AN improved vertical-wheel hand brake, known as the Equipco high-power hand brake, has recently been placed on the market by the Equipment Specialties Company, 310 S. Michigan avenue, Chicago. It is designed to overcome certain defects and weaknesses which have developed in this particular type of hand brake and to meet the full requirements of modern operating conditions from the point of view of safety, effectiveness and efficiency. Particular features of the new brake include adequate power for one-hand operation; quick take-up of chain slack; safety release lever operation towards, rather than away from, the brakeman; helical winding drum which keeps the brake chain in correct alinement; a housing which is easily removable for the inspection or replacement of parts; straight gear teeth in cast-steel gears, and self-lubrication.

The Equipco High-Power Hand Brake

The vertical wheel type of hand-brake construction usually involves the more or less permanent enclosure of working parts of the brake in a pressed steel back plate and front cover, riveted together, and this assembly riveted, in turn, to the car structure with four large rivets, the latter further holding the back plate and cover together. To inspect this brake mechanism or make a replacement it is usually necessary to take the car to the repair track, cut the four rivets holding the brake to the car, remove the brake unit, cut four or more housing rivets and completely dismantle the brake. Like any other mechanism, it should be possible to inspect hand-brake mechanism periodically and make minor replacements, if necessary, without taking the brake off of the car.

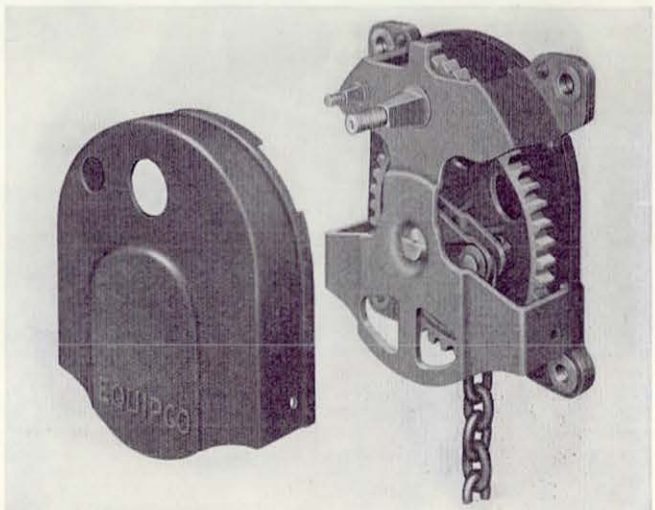
Front Housing Easily Removed

The improved Equipco brake parts, including the pinion, gear, axle, pawl, pawl trip, chain pin, etc., are carried in a rugged casting frame, with a removable pressed steel housing, the latter being used only for protecting the mechanism from the weather and keeping ice, snow and cinders out. The front housing is easily removed by the cutting of two small rivets, after which it can be readily removed, as shown in one of the illustrations.

Gear and Pinion

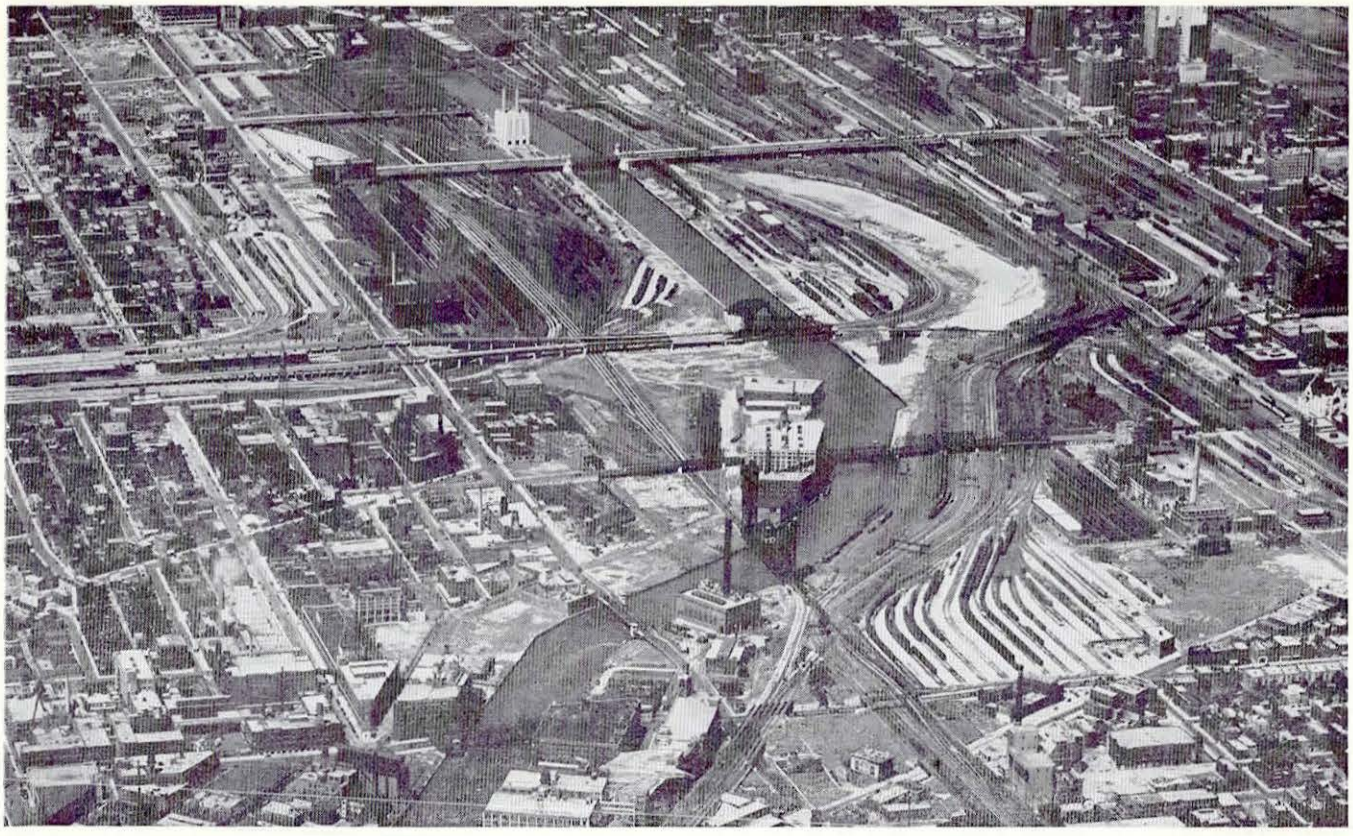
The gear and pinion of the Equipco brake have standard gear teeth which afford a full contact and avoid the end thrust common to tapered teeth. Another important improvement is the use of a helical winding drum which lines up the winding path of the drum with the angularity assumed by the brake chain and end rod when the bell crank is swung outwardly when setting the hand brake. This eliminates all overstress in the chain links, which is considerable when a chain is being pulled up at an angle to the car end while being wound on a single (vertical) plane winding drum. The Equipco helical winding drum tends to eliminate friction and the possibility of breaking chains, an important safety feature.

The brake can be set or released with one hand, which allows the operator to hold on to the ladder or roof grab iron with the other hand. One spin of the brake wheel is sufficient to take up all slack chain, and the wheels spin freely, the construction of the ratchet mechanism being such that there is no drag nor oscillation of the lever while setting the brake. In releasing the brake, the release lever is pulled towards rather than pushed from the brakeman, which also contributes to safety. After the brake releases, the release lever stops in a substantially vertical position, providing a safe natural grab handle for the brakeman's right hand. At the time the brake releases, therefore, the brakeman is standing on a firm footing and holds the car structure with his left hand while the fixed release lever is grasped with his right hand.



Front Housing Removed to Show the Rugged Casting Frame and Brake Mechanism

The Equipco brake is unusually light in weight for the power developed, the weight saving being effected without sacrifice of essential strength or rigidity. The brake is bronze-bushed at all important points and the gear hub has a pocket which is filled with graphite grease, thus assuring self-lubrication for a considerable period of time. The brake is also manufactured in the horizontal-wheel type for all classes of freight cars, and drop-type brakes for flat cars and drop-end gondolas.



Chicago Aerial Survey Photo

Large Savings Claimed for Terminal Unification

Progress report of Director of Regional Co-ordination issued, giving results of surveys made to date

IT is claimed that savings estimated at $25,000,000 will accrue from plans proposed for terminal unification and for the joint use of facilities, based on studies made by V. V. Boatner, Director of Regional Co-ordination on the Federal Co-ordinator's staff, according to his progress report just issued. This includes only such surveys as have been completed; a further estimate places the total savings possible at $50,000,000.

In submitting the report, Co-ordinator Eastman makes the following explanation:

The restrictions upon reduction in railroad employment, contained in Section 7 (b) of the Emergency Railroad Transportation Act, 1933, have been an obstacle in the way of carrying these terminal co-ordination projects into effect; but it has been evident from the beginning that there are other obstacles as well.

If the terminal facilities were the property of a single railroad system, the co-ordination proposed would probably be a simple matter to accomplish. Instead, they are owned by separate and competing companies, and some of these companies are better entrenched in the terminal district than others and think that they have a strategic advantage in the location of their freight-houses, team tracks, or industrial sidings. Notwithstanding that, terminal unification would reduce aggregate expense materially, these favorably located companies fear that the result would be loss of competitive advantage and seek compensation for such loss if it is to occur. There are also difficulties attendant upon the formation of a terminal company to conduct the unified operations, the transfer of property to it, and determination of the method of its operation.

The Co-ordinator deals with these objections as follows:

1. There is reason to believe that these strategic advantages of location and the like are much exaggerated, particularly since the advent of the truck, whether operated independently or as an auxiliary of some other railroad. It is now difficult to bind shippers to any particular railroad except through good service and treatment.

2. To a very considerable extent these alleged strategic advantages are dependent upon statutory provisions to which the railroads have no constitutional right and of which they can be deprived by legislation, i. e., the provisions against so-called "short-hauling." The railroads perform a public function; they were created solely for that purpose and it is their first duty. The public has the right to compel the best service which the rails can provide, whether it be single-line service or joint service by two or more lines. Individual railroads have no right to require traffic to move over their rails at the expense of the best possible service to the public. Open terminals can be legislated into existence; there is no legal difficulty in the way.

3. Even more important is the fact that individual railroads cannot under present-day conditions long prosper at the expense

of the best interests of the railroad industry as a whole. It is pre-eminently a time for solidarity and co-operation.

4. If the best interests of the railroad industry are to be thwarted by individual railroads, the logical conclusion will follow that the number of individual railroads must be radically decreased. This can be done through a "grand plan of consolidation," like the Prince plan or some substitute therefore, or it can be done by public ownership and operation.

The Boatner Report

An abstract of the report of the regional director follows:

At large terminals, the conclusion was reached that all activities within a terminal switching district were susceptible of co-ordination, and, in the process, that they should be organized as a unit in order to function with the greatest efficiency and without discrimination. This course was also considered necessary to prevent any line from operating individually in the terminal area, thus tending to disrupt a completely united arrangement for serving the public. Such an arrangement must necessarily exist to insure maximum economy and efficiency and to prevent any lines from enjoying full terminal advantages at lower expense than the lines in the terminal unit, which they might otherwise do by availing themselves of the low reciprocal switching charges, maintained to expedite the easy flow of traffic within the terminal area, but which do not reflect the full cost of service.

At a terminal such as Chicago or St. Louis, where many lines enter the switching district, each has a train yard for receiving and dispatching trains. Each of the 22 Chicago lines has at least one principal yard which might be termed an outlying yard. Including, however, yards used for primary purposes, there are at least 50 major yards in the Chicago switching district. These yards are usually some distance from the downtown business district. To reach the district, the line projects itself over its own or leased mileage, and in the district establishes its own freighthouses, team tracks, warehouses, grain elevators, etc., where it receives and dispatches traffic. The cars are switched in the outlying yard and each line completes the service to the downtown area with switch engines. In addition to its cars for the downtown area, a road also brings in cars for delivery to other lines, the usual practice being to deliver them either direct where a connection exists, or through the use of intermediary belt lines which connect with all lines. There are five major interchange belt lines in Chicago and eleven minor ones. At St. Louis, there is one major belt and four minor ones. All of these belts are differently owned and all secure routing either through their own efforts or the activities of their owners. With the five major belts at Chicago five major streams of traffic flow from one railroad to another, and frequently the minor belts come into play.

The Chicago Situation

Upon arrival in Chicago train yards, cars are promptly switched and started on their run to the various downtown destinations. This is repeated many times during the day as the traffic arrives, and based on a two-day check test, it results in a daily operation, from the train yards to the stock yards district alone, of 239 separate trains or switching cuts and corresponding moves from the stockyards district to the train yards. These trains or yard cuts consist of from 1 to 35 or 40 cars. More or less similar movements take place to and from the produce terminals, the potato mart, and the many downtown freighthouses, team tracks, elevators, etc. Our check for the two-day test period indicated that even the through traffic via the Chicago gateway, instead of all passing over switching lines around the city, was, to the extent of about 40 per cent, taken into the downtown area over the various lines and then moved back through the different switching lines to the outer belts, where it was delivered to the outbound lines.

In interchange of traffic between lines the general practice is for each line to deliver its cars to the yards or facilities of the other. This causes a light movement of the engine in one direction. Such movements cover distances ranging from a few blocks to several miles. Many arrangements have been worked out to enable one engine to carry the load in *both* directions, under what are termed reciprocal car pulls. This practice has been somewhat extended during the depression period, but the preponderance of traffic is still handled with each line delivering cars to the others' facilities, its engines moving light in return.

At Chicago, the cost of terminal operation in 1929 was, roundly, $120,000,000. In 1933 it was, roundly, $60,000,000. This does not include taxes and interest. The volume of traffic in this period declined about the same percentage as the expense.

The Chicago switching district extends a distance of some 45 miles and comprises about 6,000 miles of tracks. During the test period, the switch engine shifts operated averaged 975 per day, handling approximately 22,000 cars, of which 8,800 were empty, and 13,200 loaded; 7,235 loaded and 3,888 empty cars were brought into the district daily and 6,325 loaded and 4,890 empty cars moved out of it daily.

Based on this, as graphed on flow charts, and from other data available, it is estimated that the 22 outlying yards at Chicago could be reduced to 6, all located near the major belts. Considerable transfer movement will take place within these yards, avoiding the present movement of traffic by yard engines to the yards of other lines, since, under the proposed arrangement, many trains of different roads by different routes will arrive in one yard.

The number of inbound and outbound freighthouses will likewise be reduced, with a corresponding reduction in movements. Cars to team tracks, produce terminals and the like will move in combined units. A reduction will be made in engine houses, car repair and other mechanical facilities. Circuitous, costly and conflicting interchange movements will be avoided.

Other Typical Situations

The Chicago terminal does not present the same physical difficulties in concentrating traffic flow that are encountered at locations like St. Louis, where 12 lines enter from the east through different sections, each projecting itself into a small yard along the river bank capable of accommodating no more than the normal flow of its business. Each line constructed its facilities to meet individual requirements and with no view to giving access or benefit to its neighboring competitors. Incident to the heavier volume of traffic in the past, some of the St. Louis lines built larger facilities farther out.

By utilizing some of these facilities, according to the survey, the number of yards in St. Louis could be reduced from 50 general to 9 primary yards with no major capital expenditures. Some of the general yards will continue as secondary units. We are of the opinion that a further reduction of one or two primary yards with additional economy is possible.

At New York and on the Jersey shore, physical and topographical conditions offer obstructions difficult to surmount and reduce the possibilities for economy. But here wide opportunities are offered for saving in water craft operation and in the facilities thereof. At Richmond, Va., the lines cross over and under each other on three levels. Despite these physical obstacles our investigations reveal important possibilities for economy.

Carrier Objections

After the completion of the surveys by the field committees, they have referred them to the individual lines for the opinion and concurrence, or otherwise, of the operating officers. The lines that are intrenched favorably in industrial areas where they feel they enjoy major traffic advantages evince a disposition against any relinquishment of their preferential positions. No estimate of the value of such advantages has been set up in any case. Such value is intangible and speculative and in our opinion its magnitude has been exaggerated. Nevertheless, the strategic location of a railroad in a large industrial area, where it serves the major part of that area, has an intrinsic value. Whatever this value is, however, it has greatly diminished with the extension of the motor vehicle as a facility for the completion of service.

The carriers are reluctant to enter enthusiastically into pooling activities with competing lines in a terminal area. This is natural and we think there is considerable justification for such reluctance, in the light of present practices and methods of operation. They point, with commendable pride, to the adequate and efficient facilities built up over a long period of time, and more strategically located for traffic and operations than those of some competitor.

However, it is necessary to carry on terminal operations in a unified and completely co-ordinated manner if maximum operat-

ing economies are to be effected and demands for capital outlays are to be avoided. Under current methods, the railroads are rendering a service of the highest quality in their history. Competition between roads is so keen that special runs are frequently made with one car, whether or not these are necessary or are demanded by the shipper. Some carrier representatives seem to feel that a co-ordinated arrangement will in a measure nullify this service and are averse to co-ordination or unification of facilities on that account.

Necessarily, under a co-ordinated arrangement which would undertake to render a reasonable, efficient and common service for all, much of the expense of these special runs which serve no particular need would be eliminated. To some extent, the shipping public, through its traffic organizations, is jealous of any intrusion into this field that might appear to reduce the special service which it now enjoys. Industry can and will be properly served under co-ordinated arrangements, and on the whole, the flow of traffic will be expedited. Our conclusions in this respect are concurred in by the heads of some large industries and by industrial traffic managers with whom we have conferred.

Proposed Operating Company

Another obstacle that must be overcome in order to co-ordinate a terminal and operate it as a unit is the individual ownership of property and facilities. This is a complicated problem. Many of the major terminals have one or more separately incorporated switching lines. There would be no difficulty, so far as the securities of these lines are concerned, in blending them into a terminal operation,—the interest on such securities would be a part of the terminal expense. But the trunk lines reaching into the terminals have property and securities that cover areas extending beyond the terminals proper. The course we suggest to overcome this difficulty is the formation of an operating company which, under contract, would lease all facilities on a nominal rental basis over a stated period of time, leaving the securities of the roads in their present position; that switching charges be provided, based upon the present charges, and absorbed out of line-haul rates; that joint facility charges be projected on the basis of the costs of each line, determined by the average of such costs over a fair test period.

With revenues provided in this manner, and operating costs reduced to the extent estimated, the profits from operation would be the amount saved through co-ordination. The terminal operating company could assume interest upon the securities representing the property wholly confined to the terminal area and could reimburse the participating lines by the distribution of the remaining, or net, profit realized from the economies effected.

Many executives take exception to the possibility of economy under joint and concentrated operation, claiming they can operate separately more economically. This would not be true if the opportunity to avail themselves of the reciprocal, and in most cases unremunerative, switching charges were withheld from lines that come to the edge of the terminal where they assume only the train yard expense, then take advantage of the low switching rates and thereby participate in traffic to and from the entire area. These reciprocal arrangements should be abandoned under co-ordinated terminal operation. Any line not participating in a co-ordinated terminal should be denied such rates available. Instead, it should be required to operate upon the basis of paying a division to the terminal out of the line-haul rate. Such division should be sufficient to defray the cost of service and produce a reasonable profit for the terminal on the traffic so handled.

Loss of Individuality

There is much opposition to the relinquishment of individuality within a terminal area. Each line is reluctant to allow an intermediary terminal company to enter upon its property and to have access to its patrons such as a co-ordinated terminal would require. Managements feel that their interests would be seriously impaired if this were done. Unquestionably, such an intermediary would eliminate some of the personal contact which the lines have with their shippers—at least as such contact exists under present conditions. The value of this contact, however, is open to question and it would not be wholly eliminated. The individual line would continue to seek traffic through service agents and solicitors, and in many instances a more satisfactory service to the patrons than is possible now would result. Many lines do not now enjoy the business from some of the industries on their rails, as the result of aggressive solicitation by their competitors. In some instances, the loss is accentuated by minor irregularities in their switching service.

Generally speaking, the importance of such objections disappears where co-ordination or unification is actually effected, as has been demonstrated over a long period of years in jointly-owned terminals and union passenger stations throughout the country, which are universally recognized as economical methods of carrying on terminal operations.

At Kansas City, objections have been offered by some of the carriers to the co-ordination of that terminal and the traffic feature is a material factor in the objections. However, all lines at Kansas City jointly own and operate a terminal railroad which serves a large industrial area. There seems to be no record that any line does not enjoy its fair share of the traffic originating and terminating on this property under the joint method of operation. The lines seem to be willing and able under this arrangement to solicit and participate in traffic to and from this property on a basis of equality, the operation and service being left entirely to the terminal company. Therefore, it appears logical that, if the activities of such a terminal property, owned by all the carriers, were spread over the entire switching area, as the report proposes, the same relative traffic conditions would prevail throughout the entire area as now prevail throughout the restricted area served by the terminal company.

This same principle seems to be demonstrated at Chicago, St. Louis, Peoria and at other terminals throughout the country where jointly-owned but individually-operated terminal railroads exist.

The N. Y. C. & St. L. is a pertinent example of a line operating without the advantage of extensive terminal facilities of its own. Yet its record of earnings from the traffic it enjoys reflects a more wholesome condition in some respects than is found upon many lines burdened with major terminal activities, the expense of which materially affects their net earnings.

Terminals Over-Equipped

Nearly all terminals are equipped with an over-abundance of facilities of every character—more than may ever be required, especially with the greater expedition and simplicity of movement which we are seeking to provide under co-ordinated arrangements. When most traffic was handled by the rail carriers, a large intra-terminal or cross-town switching was performed, and frequently serious congestion existed. In some measure, this was induced by the shipper specifying the routing. At a number of terminals such congestion was serious and costly. It was the cause of dissatisfaction and complaint from the shippers. It caused abnormal expansion of some lines and also brought into being, in order to obtain proper service, the so-called industrial switching roads, which handle the traffic of industries by which they are owned or leased, and which often become full-fledged common carriers, soliciting the routing of all kinds of freight from all sections. The influence which the industries are able to exert because of the volume of their traffic frequently enables the industrial road to affect the advantageous flow of traffic materially, causing further complications and expense in terminal operations.

In the projection of a co-ordinated arrangement, these industrial lines would be included as a part of the system and utilized in the manner best suited to the needs of the system. Some such lines are vigorous, well-operated, and render constructive service. At the same time, their multiple activities clutter up the terminals and add materially to the expense of operation. The facilities of these carriers should be taken into the co-ordinated terminal in the same manner and upon the same general terms as the facilities of other lines utilized.

Terminal operations are a most costly phase of railroad performance. Practical men have estimated that 40 per cent of the transportation expense of the carriers is incurred in their terminals. The information obtained in a questionnaire based on the records of the carriers indicates that 53.67 per cent of the cost of transportation is represented in terminal cost, which includes the cost of intermediate yardings and interchanges as well as the cost at origin and destination terminals.

It is, therefore, imperative that ways and means be found to

bring about a lessening of this cost, so that the carriers may avoid depletion of their revenues and make rates and render service that will not only retain present traffic but regain some of that which has sought cheaper avenues of transport.

Other Unifications

Mr. Boatner's report also discussed the effect of the present high terminal costs on rates, maintaining that co-ordination, with its lower operating costs, would permit a reduction in rates and a consequent return of traffic to the rails. He outlined, too, certain general proposals for joint trackage arrangements and traffic pooling for road hauls, all of which, he maintains, would have the effect of reducing terminal costs by eliminating duplicate handling.

He also discussed briefly the possibilities of unification of the terminal mechanical facilities of the railways, stating, however, that, at the present stage of the survey, he was not warranted in making estimates or definite conclusions as to the savings to be effected by this means.

He recommended the consolidation of uptown ticket offices to save expense, suggesting the possibility of handling ticket sales through joint travel offices and through the main and branch offices of the telegraph companies.

In submitting the report, Co-ordinator Eastman said: "These terminal unification projects are physically quite practicable; they would result in large and substantial economies to the carriers; they need not impair the service to the public, and, in fact, would often improve it; and, in many instances, if the economies were translated into reduced switching charges, traffic might be materially increased."

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended February 9 totalled 592,560 cars, a decrease of 5,604 cars as compared with that for the week before but an increase of 18,662 cars as compared with the corresponding week of last year. This was also an increase of 87,897 cars as compared with 1933. The increase as compared with last year was shown in the loading of miscellaneous freight, coal, forest products, and ore. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loading

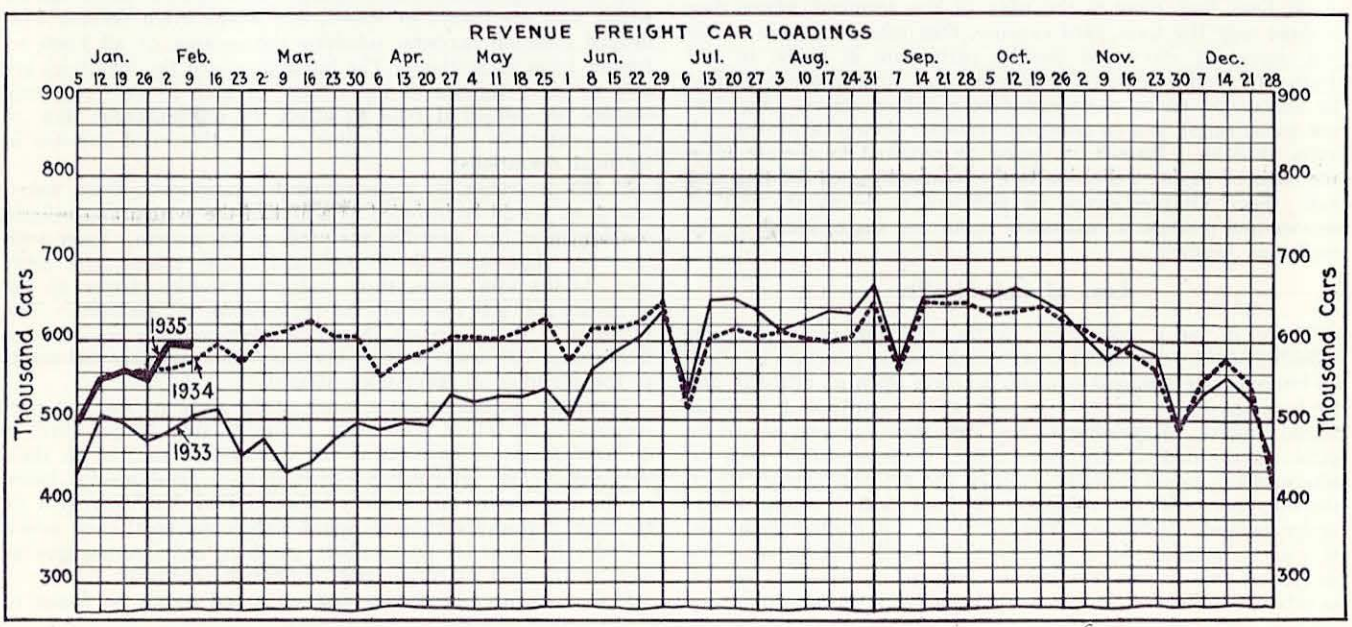
Week Ended Saturday, February 9, 1935

Districts	1935	1934	1933
Eastern	145,739	131,551	119,261
Allegheny	120,209	111,783	93,731
Pocahontas	44,160	44,041	40,885
Southern	87,678	92,200	82,307
Northwestern	67,604	64,943	50,704
Central Western	80,589	80,661	74,427
Southwestern	46,581	48,719	43,348
Total Western Districts	194,774	194,323	168,479
Total All Roads	592,560	573,898	504,663
Commodities			
Grain and Grain Products	25,212	31,271	21,533
Live Stock	12,569	13,734	15,734
Coal	150,804	139,484	148,658
Coke	9,309	10,183	7,370
Forest Products	25,414	21,396	12,344
Ore	3,133	2,596	2,097
Merchandise L.C.L.	155,535	160,348	154,109
Miscellaneous	210,584	194,886	142,818
February 9	592,560	573,898	504,663
February 2	598,164	565,401	486,059
January 26	555,768	563,100	475,292
January 19	562,955	561,902	499,554
January 12	553,675	557,266	509,893
Cumulative Total, 6 Weeks	3,361,195	3,322,380	2,914,930

Car Loading in Canada

Car loadings in Canada for the week ended February 9 totaled 44,880 as against 40,595 cars last year and 46,023 cars for the previous week, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
February 9, 1935	44,880	24,925
February 2, 1935	46,023	22,767
January 26, 1935	42,407	21,299
February 10, 1934	40,595	21,563
Cumulative Totals for Canada:		
February 9, 1935	248,806	129,539
February 10, 1934	236,835	123,641
February 11, 1933	186,397	100,728



Progress and Problems of Purchasing and Stores Departments*

Importance of railroads to life of country stressed—Attitude toward manufacturers outlined—Advance in material handling described

By U. K. Hall
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THE railroads are facing problems such as they have never faced before, and if there ever was a time when we needed to know our duty, our responsibility, and to present a unified front, it is now. Gatherings to consider joint problems are especially beneficial.

The foundation of the whole material structure of the railroads is the stores department. The organization is one that (1) records, deals with and brings forth a knowledge of the needs of the using departments; (2) has a knowledge of what is actually on hand or available at all points for use; (3) has a knowledge of the movements or requirements of such materials and supplies; (4) follows a correct method of disbursing materials; (5) has a method of accounting for such items that will produce the most correct results; (6) has an organization that will handle or supervise the reclamation of discarded materials.

Undivided Control of Material

The stores department of the average Class I railroad has in stock from 50,000 to 80,000 items of material. It is necessary to maintain records showing what materials are on hand and where; the movements of these items of material, and the requirements. The investment in materials and supplies on Class I railroads in the United States amounts to approximately $300,000,000 and, to maintain control of this large investment, consisting of such a multiplicity of items, it is necessary to have order and system. This is the keynote of successful operation. It is generally acknowledged at the present time that the stores department should have under its control and jurisdiction all unapplied materials on a railroad, wherever located. There should be no divided responsibility as to the stock investment.

In the control of stock, the foundation is the stock book or stock record. Stocks can be well balanced only by an exact knowledge of what is on hand and on order, and accurate knowledge of the movement or consumption of materials. These two factors are accomplished by the monthly count or inventory of all items in stock. Without this record, it would be impossible to control the investment or to assure that the necessary materials and supplies are on hand to meet the requirements of the road with a proper regard to the amount of the investment.

Carrying Charges 16 Per Cent

It is costing the railroads approximately 16 per cent to carry materials in stock, counting interest on the investment, handling charges, deterioration, obsolescence, insurance, taxes, etc. Thus it is necessary to hold the stock down to the lowest consistent working basis. There are times when policies dictate otherwise, as in buying ahead on a rising market for anticipated work or special conditions. These, however, are matters of executive policy and direction.

Storage of materials on a well-ordered road should conform with the stock list or stock book arrangement, the materials being placed in logical order on the shelves and readily located, all of which facilitate maintaining records showing the receipts and disbursements and data for replenishing and handling stock and general operation.

Economies in Delivery Work

The delivery of materials from stores stocks to users presents opportunities for large economies. For the delivery of materials to the maintenance of way department, along the right of way, and to section and tool houses, pumping plants and stations, the Union Pacific uses the supply train or the supply car. The using departments co-operate by checking the materials on hand upon the arrival of the supply train, to prevent unloading materials which will not be required. Representatives of using departments accompanying the supply train have opportunity to check general conditions at all points along the line, at depots, section tool-houses, maintainers' tool-houses, etc., and also to investigate the condition of tools, equipment and other details of safety-first operation.

In delivering material from stores to the actual point of use in the shops and car repair yards by store or shop delivery, the store department of the Union Pacific performs the same service for the mechanical department as the supply train provides for the maintenance of way and operating departments. The day when the high-priced mechanic came to the store for materials is a thing of the past. An organized force, usually on the store pay-roll, now picks up the requisitions at the point where the material is needed, obtains it from the store, and delivers it direct to the point of use, and also delivers material from one point to another in intra-shop movement, thus permitting mechanics to apply themselves directly and continuously to their assigned duties.

There is no operation on a railroad where more money can be saved, or where money can more quickly be lost, than in reclamation. The deciding factor is correct accounting plus effective supervision. Real reclamation consists of taking an article that has been used and making it suitable for further service to the railroad.

* Abstract of a paper presented before the Western Railway Club, at Chicago, on February 18.

Nothing should be reclaimed that will not permit a suitable profit over the cost of a similar new article. Neither should any materials be allowed in the scrap and sold as such, that can be made of further use by reworking. Constant supervision and co-ordination by both the stores department and the using departments are necessary to strike a profit in this operation.

In the last few years particularly, emphasis has been placed on simplification. The elimination of needless and unnecessary sizes produces economies for the user in reducing carrying charges and the cost of handling unnecessary items, and, for the manufacturer by making quantity output possible. Duplication of unnecessary items is just as much an economic loss as duplication of transportation service. On one road, the sizes of oak carried were reduced from 163 to 43, a reduction of 73 per cent. A report of the Purchases and Stores division of the Association of American Railroads showed a reduction in one year of 5,632 items. This shows what can be accomplished in reduction in stock investment.

Mechanical Equipment for Handling Material

In recent years, the use of material handling devices has contributed much to economy in operation. Many remember the wheel barrow, the hand truck, the horse and mule, for handling railroad materials. Material was handled in and between the shops, repair tracks, etc., over narrow-gage tracks with turntables or improvised frogs and switches. Practically all of the material in the shop was handled by hand or with cranes.

Then the tractor came into general use and, with it, the small four-wheel trailers and the large wheeled box-

ber trailers. The equipment was flexible and eliminated the narrow-gage cars. The tractors could haul the material to the point where it was actually needed. The advance was very rapid. Manufacturers placed on the market trailers which could be moved much cheaper and which were more substantial than could be manufactured in the various railroad shops. A rigid boom for tractors was placed on the market, which could lift and transport heavy items, up to approximately one ton. While these cranes could raise and lower the loads, the only way the boom could be moved would be to swing the back end of the machine. Then there appeared on the market a crane with a revolving boom. These machines have since been much improved.

Following this, the skid system for handling material between shops and stores was introduced. The skid operation required lift or elevating trucks to handle them, and as powered equipment is expensive, transportation between the shops, the stores and the smaller outside stores led to the use of hand-operated lift trucks. The skid system was adequate for short hauls, but for long hauls considerable time was lost because the power lift trucks could handle but one skid at a time. In order to make the longer hauls more efficient, the practice of placing two or more skids crosswise on the four-wheel trailer was instituted. This was one of the demands which brought forth the use of a higher lift truck to pick up the skids and place them on the trailers. The use of trailers and lift trucks has been continually improved, and their use extended not only to the shops and stores, but also to freight houses.

Another development was the placing of special containers for handling materials, not only on the skids but on the trailers, one example being tanks for handling oil. The former practice was to have storage tanks at various locations around the shops and repair tracks. A tank car was switched to these points and the oil unloaded, or the oils were transported in drums. The method now followed on many roads is to mount an oil tank on a trailer, fill the tank at the oil-house, haul it to the storage tank at the point of use with a tractor, and empty by gravity. This eliminates switching and requires less stock on hand. A system of mounting oil tanks on skids for transporting small quantities of oil, 300 gal. or 400 gal., for shipment by freight cars to the smaller outside stores, has also been developed. This eliminates the use of oil cans or barrels.

Further special uses for skids were found in handling borings and turnings, journal bearings and similar materials which must be kept locked when they are stored outside buildings. These are hinged so that the material can be locked at night and the container kept in the open. Oil-tight boxes are bolted to skids and equipped with lids having flanged covers for use in transporting journal-box packing. Skids are also bolted together with gaskets between them to handle such items as fire clay, smithy coal and similar commodities. Stationery is now shipped to the point of use in skids, eliminating the wrapping and boxing of the items. A light water-proof cover manufactured from old car roofing protects the contents.

Most of the larger roads are equipped with both trailers and skids, and continual study is made by the stores department and the manufacturers to extend the use of this equipment. A large trailer with capacity for 12 pairs of wheels was developed for handling the mounted wheels between the wheel shop and the repair tracks. This trailer is loaded, unloaded and hauled by a tractor. Hauling the wheels on cars disturbed the repair track and involved additional cost in switching. A dumping body installed on a trailer is used for handling sand, gravel and refuse from generating plants. Rubbish is dumped into the trailers direct for prompt removal, instead of on the floor. Other operations include the handling of air pumps, weighing approximately 1,700 lb., on skids; moving forgings between machines in the shops and to the store; unloading fire clay and fire brick from the cars direct into skids and delivering the skids alongside the locomotives at the point of use; placing brake beams on skids where they can be handled by a lift truck or locomotive crane without handling by hand. Skids are also extensively used in the shops for handling axles in the wheel shop. Hot materials direct from the forge are placed on skids and handled to other machines. Locomotive tires are taken from storage and placed on skids for delivery to the roundhouse and shops.

A truck with a prong is available for handling loose wheels, by which several wheels are picked up at one time and taken either from the car to the storage or from the storage to the wheel-mounting shop. The use of the lift truck has been extended by placing crane attachments on it and making it function not only as an elevating platform but for picking up items from the ground or floor.

With the increased use of equipment, there is a crying need for concrete roadways. Unless suitable roadways and crossings are installed, the maintenance of the equipment is expensive. The economies effected by the use of such equipment quickly justify the expense of installing such roadways. The use of such equipment has made it possible for the stores department to carry on with reduced forces during the depression period and has done more than anything else to reduce the cost of handling materials and supplies.

Purchasing Agent and Salesman

The purchasing agent is the officer of the railroad whose duty it is to spend money, but always to spend it wisely. He must be in constant touch with every

department head, know the general policy of the road as to future activities, both for new work and ordinary maintenance. He should be in touch with market conditions and trends. He should report to an executive officer and his position should be on a par with other department heads.

In offices where calls are frequent, the supply man should be greeted cordially, given to understand that he is welcome and that the purchasing agent will be glad to see him as soon as possible. Waiting is sometimes unavoidable and the supply man should be extended certain courtesies, such as a comfortable chair, reading matter, the use of a telephone, paper and ink, and a table to write on.

The large majority of supply men are men of ability and character, who are well informed in their line and do not call on purchasing agents unless they have something to offer which, in their opinion, will be of interest at least, and perhaps of benefit, to the buyer. He understands, of course, that this is for the purchasing agent to decide, and it is his job to put forth his best efforts to aid the purchasing agent in making the decision by placing facts and figures before him as to the quality and price, or other reasons for considering his product.

The purchasing agent should bear in mind at all times that contact with the supply man is his most reliable source of information, and should endeavor to make him feel welcome and encourage him by expressing his interest in the product offered. If necessary, the supply man should be furnished the approximate quantities purchased and, if specifications are involved, they should be furnished and samples requested for laboratory test. Competition is what a purchasing agent seeks and, under the present N.R.A. codes covering many items, where price and quality are equal, the supply man who has the most to offer and sees to it that his promises are fulfilled with reference to delivery and follow-up service, has an advantage over the competitor who expects to receive a share of the business on price only. There is no more satisfactory method whereby a purchasing agent can obtain first-hand information as to the character and reliability of a firm than as it is reflected by the supply man during his visits.

Supply Representative Entitled to Fair Hearing

The supply representative during his call is the guest of the purchasing department. He has come for a definite purpose and is entitled to a just and fair hearing. It is just as necessary for the purchasing agent and his staff to sell themselves to the supply man as it is for the supply man to sell himself, his goods and his ability and personality to the purchasing agent. A cordial reception, fair treatment and prompt hearing do more to cement a proper feeling between the purchasing department and manufacturer than any other element. It is not humanly possible to buy from every salesman who calls upon a department, but it is possible to send a salesman away without an order and still have him feel that he has been fairly treated. In such a case, he is still a friend. This, as I view it, is the essence of the proper relationship which should exist between the purchasing agent and the supply man.

The supply man is a contact man for his firm, and the fact that he has been selected to represent it entitles him to the privilege of calling on the purchasing agent at any time to discuss its product. It is this contact that will result in business for the firm, if the supply man has something interesting to offer, and all things being equal, should result in repeat orders if the goods are delivered as promised and the quality is maintained.

When the inquiry for the price on the general run of material is submitted, the price quoted should be the lowest consistent price that the salesman feels can be made. He should not depend upon bringing a price and then expect to argue and haggle and, if necessary, reduce his price to such a point as will secure the order. His bid should be final and he should expect to receive or lose the order on the basis of the figures he quotes. Thus, on submitting so-called closed bids, he is receiving the same treatment that his competitors receive.

Bids and Entertainment

The salesman should not expect to depend on high-class entertainment to sell his goods, or to advance his interests. I am not speaking of friendly entertainment and sociable relations, which are usually beneficial to both parties, but of costly entertainment which eventually will have just the opposite results. He should depend upon quality, price, delivery and service. A pleasing personality goes a long way, but such a personality can best be used to present effectively the quality of the product rather than the quality of the entertainment.

A tribute should be paid to the supply men who call on the purchasing agent. We have found them generally to be of the very highest type of representative manhood, and one of the joys of the purchasing agent is the beneficial and pleasurable effect of these daily contacts with these high-class representatives. The man who knows his product, the proper method of approach, relative knowledge of the value of time, plus the psychology of salesmanship, is the one who is of most value to the firm he represents.

Test Departments Essential

Any discussion of the subject of materials and supplies would be incomplete without emphasizing the importance of that great strong right arm of the purchasing department, namely, the engineer of tests. Where an engineer of tests works in conjunction, harmony and unity with the purchasing agent, he is a most valuable ally of the service. Upon the engineer of tests devolves the responsibility of seeing that proper materials are received, and that they measure up to and comply fully with the well-worked-out specifications for material. With the proper specifications, and a competent test department, the purchasing agent is in a position to know that the material he orders and receives complies with the specifications and is suitable for the purpose ordered and for which the railroad is paying.

Another great advantage to the purchasing agent is the placing of the various products submitted for a similar purpose upon a parity. No purchasing agent worthy of the name should consider purchasing on price only. Price and quality must be on a parity. When a competent engineer of tests states that certain articles are on a par, or are suitable for the purpose intended, then the purchasing agent can go back to the question of price, delivery and service. The best interests of the properties represented depend upon the harmony existing between the engineer of tests, the purchasing department and the department heads representing the users of the material. Here, as elsewhere, success depends upon teamwork.

Railway Purchasing and Business

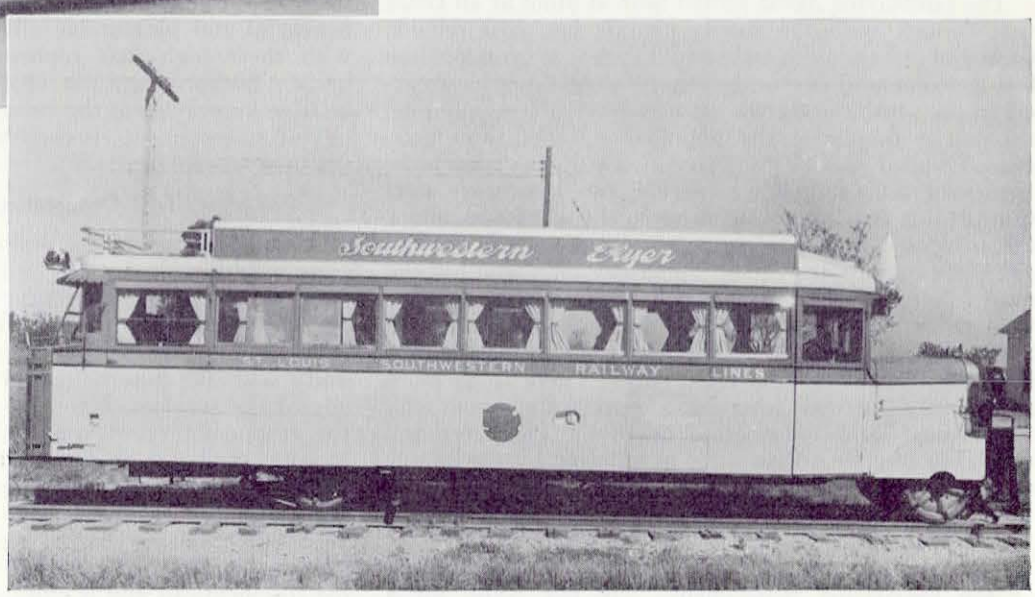
Purchases of fuel, material and supplies in the year 1929, Class I railways in the United States, amounted to the total of $1,329,535,000. For the year 1933, a total of $465,850,000, a reduction of $863,685,000, or 65 per cent. This comparison of expenditures indicates plainly and conclusively the importance of the railway

(*Continued on page 310*)

Motor Transport Section

Highway Equipment on Rails

Cotton Belt transforms motor coaches into rail cars with excellent results



Before and After — The Coach on the Highway (Above) and After Its Conversion to Rails (Right)

THE St. Louis Southwestern has been operating converted highway buses in regular service on its rail line between Texarkana, Tex., and Pine Bluff, Ark., for more than a year with most satisfactory results. Over this period, the operating costs of these rail buses have averaged between two and three cents per mile less than the original estimate, and the operation of these cars has made possible a complete revision of the Cotton Belt's passenger service on a more efficient basis.

Operating Features

This transfer of equipment from highway to rail had its inception in 1932, when a Yellow-W coach was converted into a rail inspection car by the application of a driving mechanism manufactured by the Four-Wheel Drive Company, and four-wheel drive axles, the wheel design having been evolved by Cotton Belt engineers. The operation of this car proved quite successful, and in 1933 two Yellow Z 2-50 coaches were similarly converted for regular passenger service.

Late in 1933, these coaches were put in daily operation between Texarkana and Pine Bluff, a distance of 151.7 miles. Their on-time performance throughout the year has been unusually good. They have an available speed of 64 m.p.h. forward and an unusually high-speed reverse gear, permitting 60 m.p.h. in reverse.

Prior to the operation of these rail-buses, the Cotton Belt operated a through train in each direction daily between Dallas and St. Louis. Shortly after the rail-buses began their runs, this train was made an overnight run between Dallas-Shreveport and Memphis. At the same time, an overnight train was scheduled between Pine Bluff and St. Louis. Pine Bluff and its vicinity had previously been served only by the through Dallas-St. Louis train of the Cotton Belt which passed through these cities at inconvenient early morning hours and did not arrive in St. Louis until late in the day.

Type of Equipment Converted

The motor coaches which were converted into rail-buses had each registered 350,000 miles in highway service on regular bus routes of the Southwestern Transportation Company, before that company sold its coach interests to the Southwestern Greyhound Lines, These

two coaches have since completed a total of 80,000 miles each of service on railway tracks. So far as their mechanical operation is concerned, the number of road failures on the rails has been materially less than when they were in highway service.

The rail-buses have a capacity of 27 passengers and weigh 25,800 lb. empty. This is about 2,500 lb. heavier than when they were in road service, accounted for by the installation of lavatories, pilots, sand boxes, etc. The water tanks for the lavatories and toilets have also been piped to the radiators and serve as auxiliary water tanks for the purpose, while an auxiliary oil supply is also carried.

Comparative Costs

Each rail-bus has a capacity of 134 gal. of gas, which is ample for a round trip, the buses being supplied with gas only at the Pine Bluff end of the runs, where tank facilities are more readily available than at Texarkana. They are mechanically inspected and maintained at Texarkana by the bus and truck mechanics of the Southwestern Co. They average five miles per gallon of gas and despite the increase of 1¼ tons in weight, their gas consumption is the same as when they were in equivalent highway service.

The number of stops and of reductions in speed is, of course, a predominating factor in fuel consumption on either highways or on rails. In view of this, an approximately equivalent gas consumption is remarkable, since the rail-buses make as many or more station stops, and since the railway crosses many more highways at grade between these two points than the highway crosses railways, making more speed reductions necessary in the rail operation.

As previously stated, these units are being operated at a cost from two to three cents a mile cheaper than was anticipated, the figure of savings being based on a year's careful cost studies.

Mechanical Details

The operation of these rail-buses brought out a number of interesting comparisons, particularly as to braking. The coaches in their original form were, of course, equipped with automotive-type air brakes, and, in highway operation, a brake chamber pressure of 75 lb. was maintained and found to be satisfactory.

Because of the adhesion factor, this pressure was arbitrarily reduced to 30 lb. before the coaches were put on the rails. This, however, proved unsatisfactory under actual operating conditions because of excessively severe braking action. The brake leverage was then reduced and the air pressure was established at 17 lb. As far as actual braking was concerned, this pressure was satisfactory enough, but difficulties were encountered in keeping the pressure at exactly 17 lb. At such low pressure, even as much as one pound variation one way or the other represented a large percentage of increase or decrease, as the case might be, in the braking effect.

The braking problem was finally solved, however, when the Cotton Belt purchased brake lining with as low a co-efficient of friction as possible. After this was applied, the brake chamber pressure was increased to 50 lb., and no further difficulties have been encountered.

The buses were operated for a time with the ordinary highway spring system. This, however, proved unsatisfactory for operation on metal wheels and rails. A new spring suspension, adapted to the prevailing conditions, was designed by Cotton Belt engineers, and, since its application, rough riding has been eliminated.

Grand Trunk Makes Collection and Delivery Service Permanent

FOLLOWING the results obtained during 1934, door-to-door delivery of less-than-carload freight, without additional charges for cartage, between stations on its line has now been made a permanent feature of service provided by the Grand Trunk Western. This collection and delivery arrangement was inaugurated by the Grand Trunk on its lines west of the Detroit and St. Clair rivers on December 1, 1933, for an experimental period of one year, and provided for free pickup and/or delivery service at regular rates for distances up to 260

The First Bus Converted Is Used as an Inspection Car

NEWS

General Motors Plans New Diesel Locomotive Plant

Will proceed immediately with the construction of facilities near Chicago

The General Motors Corporation has taken an option for the purchase of property near Chicago where it expects to proceed immediately, through its subsidiary, the Electric-Motive Corporation, with the construction of a new Diesel locomotive manufacturing plant.

"In making this move," said Alfred P. Sloan, Jr., president of the General Motors Corporation, "we are prompted by the belief that perhaps the most important need looking to recovery in this country is the entrance of private initiative and capital into new fields of development. General Motors is demonstrating its faith in the possibilities of the future. The operation of our new plant will provide increasing opportunities for employment, and its construction will expand work in the building and allied trades during the next few months."

Diesel engines for the Electro-Motive Corporation will continue to be supplied by the Winton Engine Corporation, a subsidiary of General Motors, from its Cleveland plant. Winton is supplying engines for a number of locomotives now in the course of construction. The Winton Diesel engine is used as a power plant on the Burlington Zephyr, the Union Pacific's M-10001 and the new Flying Yankee of the Boston & Maine and Maine Central.

The Electro-Motive Corporation was a pioneer in the development of rail cars powered by automotive equipment. The company was organized in 1922, at a time when railroads were beginning to use motorized cars particularly on the short lines. Its first cars were placed in service in 1924, and proved successful.

The construction of the first unit of the new plant will begin immediately and it is expected that it will be operating by August of this year. The Austin Company of Cleveland has announced that it has been awarded the contract for its design and construction.

Southern Pacific Steamship Service to Hampton Roads Authorized

The Interstate Commerce Commission has issued a report and order authorizing the Southern Pacific to operate its Atlantic steamship lines between Portsmouth, Newport News, and Norfolk, Va., and Galveston and Houston, Tex., making the necessary finding that such service is in the interest of the public.

New Industries on the 'Frisco

A total of 185 new industries, representing new investments aggregating $1,667,725, were established during 1934 in cities and towns served by the St. Louis-San Francisco. This compares with 169 new industries representing $786,325 in 1933 and 454 industries in 1929.

Rules Limiting Issuance of Telegraph Franks

The Federal Communications Commission has issued new regulations for the issuance of telegraph franks, permitting their issuance to full-time officers, agents, and employees of railroad and other carrier companies but limited to messages for which the published charges would not exceed $50 in any calendar year for each person to whom a frank is issued.

Club Meetings

The Railway Club of Pittsburgh (Pa.) will hold its next meeting at the Fort Pitt Hotel, Pittsburgh, on Thursday evening, February 28. Pictures illustrating the subject of "Speed" will be shown by the Pennzoil Company; and there will also be a minstrel show.

The Toronto (Ont.) Railway Club will hold its next meeting on Friday evening, March 1, at the Royal York Hotel, Toronto. C. A. Saylor, C.N.R., Sarnia, will speak on operation of an engine terminal.

The New England Railroad Club will hold its annual meeting at the Copley-Plaza Hotel, Boston, on Tuesday evening, March 12. The usual dinner will be held at 6:30. The Bethlehem Steel Company will show a motion picture illustrating the manufacture of steel.

Pelley Addresses Washington Transportation Club

J. J. Pelley, president of the Association of American Railroads, spoke briefly at the annual dinner of the Washington, D. C., Transportation Club on February 14 regarding the work of the association. After outlining the purpose of the association, which he said was to deal with matters of common concern to the railroads and to get the right answers to problems of common concern, he said he did not know, before becoming president of the organization, that there were so many common problems that could come up, but that, although the association is proceeding slowly, he believed it would accomplish worthwhile things. "I know you are wondering what we are going to do and what we are doing," he said. "I believe this association is going to do for this important industry everything that can be done for the industry within the industry."

Study of Frozen Per Diem Plan Nearing Completion

A.A.R. directing investigation of proposal as possible substitute for car pooling

Under the direction of the Association of American Railroads, railroads of the country are making a detailed study, now nearly completed, of the universal application of a frozen per diem plan as a possible substitute for the car pooling plan recommended by Co-ordinator Eastman's organization. The plan contemplates the ascertainment of the actual number of days cars of one line have been located on another, as the average for the corresponding months of three previous years, and allowing roads to hold cars of others for such loading as may be available or in prospect, paying the same amount of per diem per car monthly as was paid prior to the agreement becoming effective.

This avoids the movement of empty cars home to save per diem expense, and the payment may be based on the average for each owning road or the average for all roads. Such a plan has been in effect for some time by special agreements between the Pennsylvania and the New Haven, between the New Haven and the Boston & Maine and between the Boston & Maine, the Maine Central and the Bangor & Aroostook, resulting in large savings in interchange of empty cars. Broadening of the plan was recommended by the general committee of the transportation division of the American Railway Association last summer but the Car Pooling Section of the Co-ordinator's organization has regarded it as only a partial remedy for the problem.

A detailed study of the plan was authorized some time ago by the board of directors of new railroad association, but a final report is yet to be submitted and the plan has not yet been definitely approved by the directors.

President Plans Transport Message Within Next Week

President Roosevelt plans to transmit to Congress in about a week a message dealing with the principle of co-ordinating regulation of all forms of transportation in a single body.

W. T. L. Class Rates Postponed

On petition of the railroads the Interstate Commerce Commission has postponed the effective date of its order of October 9, 1934, prescribing a revision of class rates in western trunk line territory, from March 20 to July 20.

Continued on next left-hand page

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The First Bus Converted Is Used as an Inspection Car

miles, and at additional rates beyond that mileage. On September 20, 1934, the Grand Trunk extended the scope of that arrangement by increasing the free collection and delivery area to cover all of its lines in Illinois, Indiana, Michigan and Wisconsin.

Through the experience gained during the experimental period, the management has satisfied itself that the free pickup and delivery system is being appreciated by its patrons, and that conclusion is now verified by the action in making the temporary arrangement a permanent one. During the test period in which the arrangement has been in operation, the service has brought back to the railway considerable merchandise traffic.

C. & N. W. Increases Rail-Highway Co-ordination

WITHIN the past few weeks, the Chicago & North Western has initiated important plans for both motor coach and truck co-ordination with its rail lines. Steps to improve the co-ordination of service between trains and buses, including adjustments of schedules, the provision of "feeder" buses and the general education of sales representatives of both lines, are being taken by the railway and the Interstate Transit Lines, its subsidiary motor coach company.

Among the most recent co-operative steps that have been taken is an arrangement whereby rail tickets are honored on Interstate Transit Line buses if their schedules are more convenient. It is also possible to buy railroad transportation, travel by bus and ship one's baggage by rail.

Examples of "Feeder" Services

A few examples of the "feeder" type of service established between these companies are:

Buses between Rockford and Dixon, connecting with The Columbine and the Pacific Limited trains for the west.

Service between Des Moines, Iowa and Boone, and between Des Moines and Ames, connecting with the Mountain Bluebird and The Columbine trains.

Sioux City-Omaha service, connecting with transcontinental trains of the C. & N. W.-U. P. at Omaha.

Buses from Lincoln to Omaha, connecting with the Mountain Bluebird and the Corn King Limited for Chicago.

The Chicago & North Western entered the bus field several years ago. Through increased co-ordination, it is endeavoring to make both services, train and bus, serve the public to the best advantage. Interstate Transit Lines schedules are carried in the North Western timetable folders.

The Interstate Transit Lines, operating both the Chicago & North Western Stages and the Union Pacific Stages, serves 3,000 miles of routes along the North Western, in addition to a network of routes between Omaha and Pacific Coast points.

Unrestricted Pick-up and Delivery

Permission to establish free pick-up and delivery service on less-than-carload shipments—with no restrictions as to distance carried or to weights—has also been asked of the Western Trunk Line Committee by the North Western, as a further step to combat highway competition. This service, when made effective, will be the first unrestricted free pick-up and delivery service to be established in this country. This arrangement will affect more than 1,100 freight stations on the North Western and Omaha railroads. The rates on the new proposed service will be the same as the present station to station rates—the costs of the pick-up and delivery will be absorbed by the North Western.

In the proposal submitted, shippers and receivers are given the option of two arrangements:

1. The Chicago & North Western will take care of the pick-up and delivery.

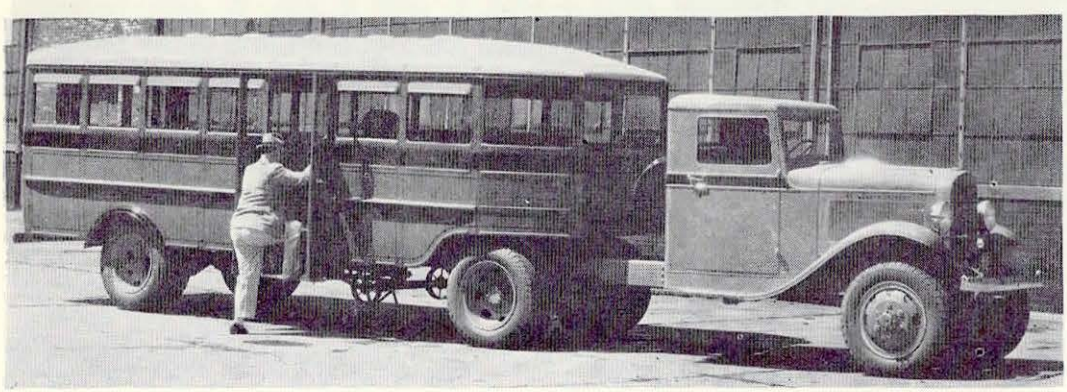
2. The railway will make allowances for trucking to the shipper, the receiver or the trucking company doing the work.

Local cartage companies at every station on the system will do the work for the North Western under a contract arrangement with the road.

New Multiple-Duty Bus

A NEW semi-trailer type of bus, the truck chassis of which may be detached and used for a variety of purpose, is offered by the Marmon-Herrington Company, Indianapolis, Ind. This unit is composed of a four-wheel-drive chassis and a semi-trailer bus body of light-weight, all-steel, safety construction. The vehicle is adaptable to either city or inter-city service and to school bus service.

It drives through all four wheels, has dual tires on the rear, standard and auxiliary transmissions for difficult operations. The coach body is of the pressed steel type of automotive construction, with undersprung springs, radius rods and numerous safety features. The body is fireproof, crashproof and splinterproof. The low center of gravity, true alinement of the axles and newest type brakes combine to eliminate road sway and to insure positive traction and deceleration.



A Bus That Can Be Used in Many Services

Katy Transportation Company Had a Good Year

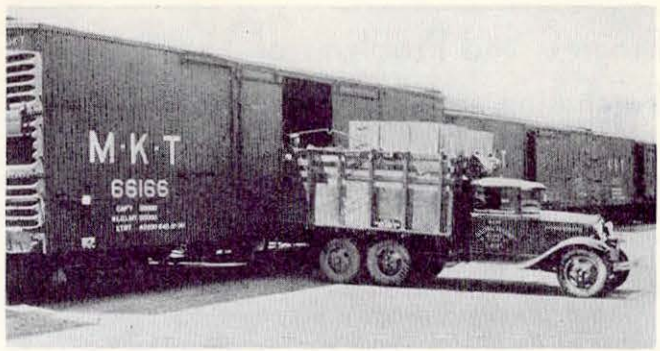
THE Missouri, Kansas & Texas Transportation Company, the subsidiary through which l. c. l. business is handled in Texas for the Missouri-Kansas-Texas Railroad Company, showed an increase in tonnage every month of 1934, except November, with exceptionally heavy gains during the first five months. Even with the decrease in November, 1934 was the heaviest tonnage year in the 4½ years of the transportation company. The results demonstrate the effectiveness of collection and delivery service in restoring traffic.

The accompanying table from the transportation company report shows 83,551,311 lb. of l. c. l. merchandise handled during the year, compared with 69,763,403 lb. in 1933, an increase of 13,787,908 lb., or 20 per cent.

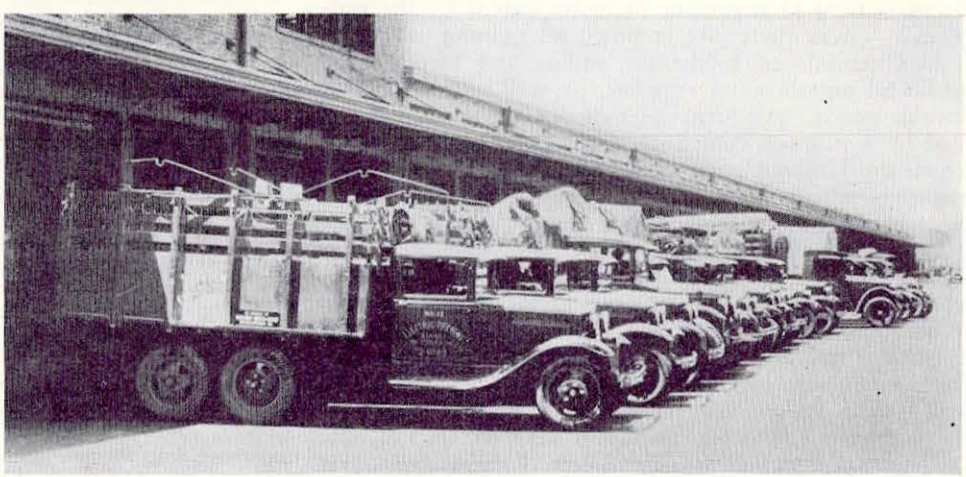
While the transportation company's revenue figures for the month of December are not yet available, the revenue for the 11 months of 1934 was considerably in excess of that for the entire year of 1933; while a conservative estimate of the revenue for December, 1934, will show an increase over 1933 of approximately 13 per cent. The increase in tonnage was proportionately greater than in revenue because of lower freight rates, changes in classification of various articles during 1934, and increased cost of trucking under the code.

An analysis of the transportation company's tonnage figures for the year just closed reveals especially heavy increases for the first five months of the year, compared with the same months last year, while increases during the last half of the year were not nearly so pronounced. This was because of a recession in many lines of business and industry in Texas, by reason of the extremely high temperatures and the severe drouth, and the failure of cotton and its by-products to move, together with the fact that during the last half of 1933 a much heavier volume of merchandise was handled than the year previous.

Notwithstanding these facts, the company enjoyed a very good business during some of the fall months. August, September and October were the heaviest tonnage months in the history of the transportation company. The increase in tonnage over 1933 of 20 per cent is more notable when it is considered that the volume in 1933 increased over 1932 by 38 per cent. At the same time, the railroad's l. c. l. traffic, as distinguished from the transportation company business, that is, merchandise handled on railroad billing from the transportation company stations, increased 9 per cent over 1933.



Pick-up and Delivery Service Produced a 20 per cent Increase in Merchandise Handled in 1934

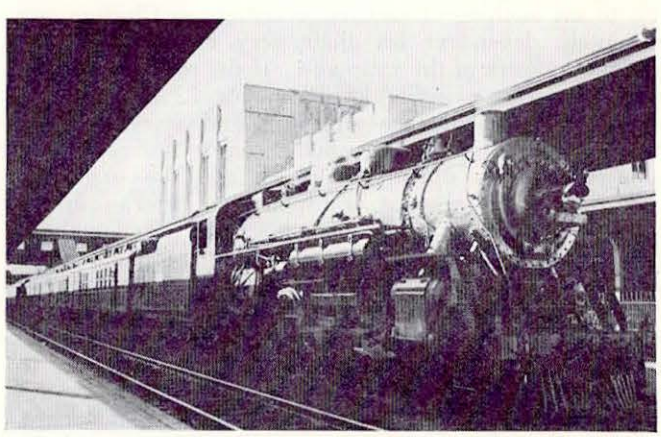


A Fleet of Delivery Trucks at the Dallas Freight Station

L. c. l. Merchandise Billed Outbound by the Transportation Company in 1934 as Compared with 1933

Month	1934	1933	Increase
January	6,723,745 lb.	3,486,133 lb.	3,237,612 lb.
February	6,440,842 lb.	3,664,943 lb.	2,775,899 lb.
March	7,072,295 lb.	4,681,757 lb.	2,390,538 lb.
April	6,459,934 lb.	5,071,437 lb.	1,388,497 lb.
May	7,451,341 lb.	5,784,466 lb.	1,666,875 lb.
June	6,342,373 lb.	5,903,715 lb.	438,658 lb.
July	6,810,306 lb.	6,501,096 lb.	309,210 lb.
August	7,941,907 lb.	7,189,883 lb.	752,024 lb.
September	7,778,792 lb.	7,698,310 lb.	80,482 lb.
October	7,795,075 lb.	7,314,388 lb.	480,687 lb.
November	6,903,342 lb.	7,038,558 lb.	135,216 lb. (dec.)
December	5,831,359 lb.	5,428,717 lb.	402,642 lb.
Total	83,551,311 lb.	69,763,403 lb.	13,787,908 lb.

* * *



A Chicago & North Western Train at Omaha (Neb.) Union Station

Progress and Problems of Purchasing and Stores Departments

(*Continued from page 305*)

purchasing power to the communities generally, and this drop in volume of purchases is a challenge to business generally. If the railroads could be put on their feet and their purchasing power increased, it would be a powerful stimulant to all business.

The difference between a period of depression and a period of normal or boom business activity largely resolves itself into a question of the proportionate decrease in the volume of demand for capital goods, the decrease in consumers' goods being relatively small. I mention this merely to emphasize the importance that the railroads should play in recovery with their tremendous needs for materials of all kinds, their potential requirements of all manner of materials, both for maintenance and operation, and their needs for new equipment of all kinds. From these purchases all industrial centers and business communities of the individual railroads prosper in direct proportion to the expenditures which a railroad is able to make and which their necessities demand.

Almost every conceivable item of material that is produced is used to a greater or lesser extent by the railroads. These materials embrace all manner of goods from chemicals to foodstuffs, radios and furniture to medicinal and hospital supplies, as well as all lines of durable goods. All forms of industry are directly benefited by a railroad company's purchases. The territory which the Union Pacific traverses benefits heavily from materials which it purchases, and these purchases also react to the benefit of industrial centers generally.

What has been said of the Union Pacific applies equally well to all roads. The railroad industry as a whole represents the largest users of material, and there is no state in the Union that is not vitally affected by railroad purchases, and, therefore, by railroad prosperity. Great manufacturing and distributing centers in the East and Middle West are dependent to a large extent upon the purchasing power of the railroads. When the railroads prosper, they prosper. In time of depression when the railroads cannot buy, their factories will run largely on a limited basis.

Railroads and the Public

Let us present these problems to the public. We are fighting a battle, not just for the railroad and industrial dollar, but for the salvation of the country, for, despite the various lines or forms of competition, who will not acknowledge that the very safety and life of our country, to say nothing of such large centers as Chicago, are absolutely dependent for their very existence on the carrying powers of the railroads. If the railroads should close down for a period of 48, 60 or 72 hours, these communities would face suffering and starvation immediately. Not only this, but the very safety of our country depends upon the upkeep and the successful operation of these great transportation arteries in the case of war, famine and pestilence. What other methods could be devised in rapidly transferring troops and supplies in case of necessity? The World War showed conclusively the value of such service in the mobilization and transporting of troops and equipment. We have the great satisfaction of knowing that in our endeavors to present our mutual interests, successfully, we are working not only for the existence of railroads and industries, but for the safety, salvation, security and peace of the communities in which we live.

A Communication . . .

Unfairly High Wages Divert Traffic to Competitors

Glen Ridge, N. J.

To The Editor:

It is unfortunate that the railroad labor leaders should choose this time to make their demands for a 30-hour week and full crew regulations. If the carriers were making large profits and paying big dividends, undoubtedly there would be much public support for the movement. However, such is not the case. In the face of declining trends in passenger and freight traffic, hampered by governmental regulation and restriction, and badgered by severe highway competition, the railroads cannot absorb this additional burden to their payrolls without precipitating either bankruptcy or government ownership—either of which would be detrimental to the welfare of railroad labor.

Perhaps the vital point which the labor leaders fail to recognize is that the American public is the ultimate judge of the fairness of wages, for, as is always the case, the public pays the bill. If the cost of labor necessitates a price for the product which is above the value the public is willing to pay, public patronage is contracted and many employees are thrown out of work. Although the labor unions, through their strong organizations, can force submission to their demands for higher wages, they cannot compel the public to travel and ship by rail.

Experience has shown the fallacy of any attempt by an organized minority to exact a more than equitable division of the national income. When, for instance, bricklayers demand an exorbitant price for their work, the cost of brick houses and brick buildings is greatly increased with the result that it is very profitable for builders to devise means of reducing the amount of bricks used in construction, and a greatly expanded demand is felt for less expensive types of construction. The very high wages achieved by the bricklayers' union during the boom period has been a major factor in the widespread unemployment of this group today. There will never be a return to the munificent days of the boom period, because the artificial wage scale established then has greatly accelerated the growth of new methods of construction and has stimulated the development of pre-fabricated houses and other similar innovations.

The competition of the highway bus determines the real bargaining power of railroad passenger trainmen. The railroad passenger man fundamentally is selling the same service as the highway bus driver. It is interesting to compare the responsibility and effort involved in each case.

The railroad conductor assumes the responsibility for his transportation unit. He has the direct assistance of an engineer, a fireman, a baggageman, a brakeman, and usually a flagman. His train moves over an expensive private roadway, carefully guarded by every possible safety device. In contrast, the bus driver has the sole, undivided responsibility for his ponderous vehicle. He is the engineer, fireman, baggageman, brakeman and conductor combined. He has no private roadway, but must direct his bus through the nerve-racking traffic of crowded streets—in addition to collecting fares, making change, handling baggage, and assisting passengers on and off his bus. Certainly the comparison arouses little sympathy for the pleas of the railroad labor leaders.

Railroad employees would be better served by efforts to increase the individual revenue-producing output of the worker, to the end of reducing the cost of the service and expanding the volume of business. Railroads are essentially mass transportation and a large volume of traffic is vital for profitable operation. In the long run, railroad labor will reap the greatest benefit through the introduction of light-weight, inexpensive units, capable of providing frequent fast service at low cost.

Of course, the action of railroad labor leaders is not unnatural. Obviously the primary purpose of labor leaders is to make demands, for that is what keeps the dues-paying constituents in line. They are in the position of being perpetually compelled to make new demands—for, when there are no demands to be made, the period of usefulness of the labor leaders is past.

William B. Firman

Odds and Ends . . .

International Opera Trains

The trains operated from Holland into Germany so that the Dutch may attend opera in the German border town of Aachen, are claimed to be the only "opera trains" in the world—at least the only international ones.

Gages

We are inclined to be amazed at Australia's "battle of gages" being waged among the various provinces, yet, in the United States, there were no less than 12 different gages in use on the railways as late as 1866, ranging from 6 ft. down to 4 ft. 3 in.

Revived Interest

One of the unlooked for by-products of the revived interest in railroads, as exemplified in the streamlined trains, was the effect on the toy train industry. The pre-Christmas sales of the tiny "Zephyrs" and "M-10001" far exceeded expectations, necessitating the operations of the factories in two and sometimes three shifts.

An 80-Year Service Record

Another milestone for Johnny Horan—the railroader with the world's long distance service record. He reached the age of 97 on Wednesday, January 23, and, as usual, will put in a full day's work at the Milwaukee Road's shops in Milwaukee, Wis. Johnny's hope is that Congress will permit him to work until April 17, 1935, when he will conclude 80 years of continuous service with the Milwaukee.

Settling Down

Inveterate travelers sometimes end their lives rooted to one final location. Such is the fate of many Canadian National box cars—after traveling hither and yon, through all sorts of weather and on all kinds of missions—they settle down. Out in Winnipeg, several box cars have become "club houses" adjoining skating rinks, and maybe the boys aren't proud of them. The service clubs, Y. M. C. A. and other organizations appealed to the railway for the use of old box cars and 35 cars were presented for that purpose.

More Twins

New Kensington, Pa.

To the Editor.

I note your item regarding the Sweeney twins working out of one terminal for one railroad.

The Pennsylvania can boast of the same distinction. Joseph and Samuel Call, residing at Freeport, Pa., are twins. They were employed as firemen in 1899. Both were promoted to enginemen in 1902 and at present they are running out of Kiskiminetas Junction terminal on the Conemaugh division of the Pennsylvania.

H. L. Kiskadden.

Happy Wedding!

"Bride and groom" cars will play a role in the operation of the Pennsylvania's electrified lines. They are not, as might be supposed, luxurious conveyances for the honeymoon trips of the wealthy. The name is one given by trainmen to a special type of car which has been designed to meet the needs of local service in electrified zones. "Bride and groom" cars are intended to be operated in pairs. One car of each pair is a self-propelled unit carrying its own motors. The other is a trailer, exactly similar as far as the passenger accommodations are concerned, but without motors. Where the traffic requires longer trains, two or more pairs are connected together and in this manner trains of any desired length may be made up. Some of these cars have already been operated in the New York area. Twenty-three additional pairs have been put under construction at the Altoona Works to meet the needs of local service between Baltimore, Md., and Washington, and increased service in and out of New York, when the through electrification is completed. As to which is the "bride" and which the "groom," railroad men will not commit themselves. Everyone, they say, must decide for himself. It depends, apparently, on the answer to the question, which is the "head man" of a married couple?

Persistence

James Sullivan is warehouse superintendent for the Michigan Central in Chicago and John Reilly is night superintendent for the Universal Car Loading Company. If Frank "Three-Gun" Murray had known their names and if he had further known that they are both former police sergeants, he might not have done what he did. But, not having the advantage of such knowledge, Frank went ahead and he is now in jail. As the two Irishmen were talking over old times in the warehouse office one night recently, there was a knock on the door, and a young man with a pistol entered. "It's a stick-up," said the gunman. As he turned to close the door, Sullivan grabbed him, disarmed him, and placed him in a chair. Reilly started to telephone police headquarters, when the visitor produced another revolver. "I told you it was a stick-up," he explained. The ex-policemen again disarmed him and as one of them reached for the telephone, the gunman drew a third revolver. "Fun is fun, but we are in no mood for jokes," said Sullivan, as the two subdued the gunman a third time.

Mountain Climbers

In America, we have our mountain climbing railways, such as those up Mount Washington, Pike's Peak and Mount Lowe, but Europe is full of them and Germany probably has the record in this respect. The first of these was built in 1883, a steam cog-wheel road running from Koenigswinter up to the Drachenfels. In 1888, the adjacent Peters Mountain Railway was built, also starting from Koenigswinter and ascending to an elevation of 996 ft. In 1900, the Brocken Railway ascending to the summit of the Brocken, 3,390 ft. above the sea, was built. During the summer of 1907, the cable railway of Wildbad in the Black Forrest was built. This railway only ascends 870 ft. over a distance of 2,190 ft. It is a cable road of only two coaches, each looped to the common cable, the downward momentum of the one drawing the other up. The same principle applies to the Koenigsstuhl Railway of Heidelberg which was opened in 1907. It carries passengers up to an elevation of 1,632 ft. The Malberg Railway ascending from Bad Ems to an elevation of 996 ft. and the Nero Mountain Railway mounting from Wiesbaden to 735 ft. are likewise cable railways. On the Mercurius Railway of Baden-Baden the tourists ascend to 1,110 ft. in slanting coaches, each seat being higher than the one in front and allowing a free view during the ride for every tourist.

The first mountain railway in the Bavarian Mountains was completed in 1912, up the Wendelsteinpyramide, 5,517 ft. Its trains are pushed by an electric locomotive. At Brannenburg the railway becomes a cog-wheel road and continues as such for a stretch of about six miles. The first suspension railway was built shortly after the war from Oberwiesenthal, Germany's highest city, 2,865 ft., up to the Fichtelberg, on the Czechoslovakian border, having an elevation of 3,636 ft. The entire run is made in six minutes. The Bavarian Kreuzeck Suspension Railway does the ascent to the Kreuzeck, 4,800 ft., near Garmisch-Partenkirchen in 9 min. But the boldest and most imposing of the European mountain railways is the Bavarian Zugspitze Railway which covers only the last section of the run as a suspension railway. It starts from the Riessersee as an electric train, then becomes a cog-wheel train on the second stretch, overcoming a steeper gradient than any other mountain railway in Europe. As a suspension railway, it then covers the last lap to the summit of the Zugspitze at a height of 9,711 ft.

Other suspension railways of importance include those from Bad Harzburg in the Harz Mountains to Burgberg, from Bad Reichenhall up to the Predigtstuhl at an elevation of 4,731 ft. from Oberstdorf in the Allgaeu Mountains—the longest suspension railway in the world—to the Nebelhorn, 6,675 ft., from Garmisch-Partenkirchen to the Wank, 4,950 ft., and from Freiburg in the Black Forest up to Schauinsland, 3,858 ft.

NEWS

General Motors Plans New Diesel Locomotive Plant

Will proceed immediately with the construction of facilities near Chicago

The General Motors Corporation has taken an option for the purchase of property near Chicago where it expects to proceed immediately, through its subsidiary, the Electric-Motive Corporation, with the construction of a new Diesel locomotive manufacturing plant.

"In making this move," said Alfred P. Sloan, Jr., president of the General Motors Corporation, "we are prompted by the belief that perhaps the most important need looking to recovery in this country is the entrance of private initiative and capital into new fields of development. General Motors is demonstrating its faith in the possibilities of the future. The operation of our new plant will provide increasing opportunities for employment, and its construction will expand work in the building and allied trades during the next few months."

Diesel engines for the Electro-Motive Corporation will continue to be supplied by the Winton Engine Corporation, a subsidiary of General Motors, from its Cleveland plant. Winton is supplying engines for a number of locomotives now in the course of construction. The Winton Diesel engine is used as a power plant on the Burlington Zephyr, the Union Pacific's M-10001 and the new Flying Yankee of the Boston & Maine and Maine Central.

The Electro-Motive Corporation was a pioneer in the development of rail cars powered by automotive equipment. The company was organized in 1922, at a time when railroads were beginning to use motorized cars particularly on the short lines. Its first cars were placed in service in 1924, and proved successful.

The construction of the first unit of the new plant will begin immediately and it is expected that it will be operating by August of this year. The Austin Company of Cleveland has announced that it has been awarded the contract for its design and construction.

Southern Pacific Steamship Service to Hampton Roads Authorized

The Interstate Commerce Commission has issued a report and order authorizing the Southern Pacific to operate its Atlantic steamship lines between Portsmouth, Newport News, and Norfolk, Va., and Galveston and Houston, Tex., making the necessary finding that such service is in the interest of the public.

New Industries on the 'Frisco

A total of 185 new industries, representing new investments aggregating $1,667,725, were established during 1934 in cities and towns served by the St. Louis-San Francisco. This compares with 169 new industries representing $786,325 in 1933 and 454 industries in 1929.

Rules Limiting Issuance of Telegraph Franks

The Federal Communications Commission has issued new regulations for the issuance of telegraph franks, permitting their issuance to full-time officers, agents, and employees of railroad and other carrier companies but limited to messages for which the published charges would not exceed $50 in any calendar year for each person to whom a frank is issued.

Club Meetings

The Railway Club of Pittsburgh (Pa.) will hold its next meeting at the Fort Pitt Hotel, Pittsburgh, on Thursday evening, February 28. Pictures illustrating the subject of "Speed" will be shown by the Pennzoil Company; and there will also be a minstrel show.

The Toronto (Ont.) Railway Club will hold its next meeting on Friday evening, March 1, at the Royal York Hotel, Toronto. C. A. Saylor, C.N.R., Sarnia, will speak on operation of an engine terminal.

The New England Railroad Club will hold its annual meeting at the Copley-Plaza Hotel, Boston, on Tuesday evening, March 12. The usual dinner will be held at 6:30. The Bethlehem Steel Company will show a motion picture illustrating the manufacture of steel.

Pelley Addresses Washington Transportation Club

J. J. Pelley, president of the Association of American Railroads, spoke briefly at the annual dinner of the Washington, D. C., Transportation Club on February 14 regarding the work of the association. After outlining the purpose of the association, which he said was to deal with matters of common concern to the railroads and to get the right answers to problems of common concern, he said he did not know, before becoming president of the organization, that there were so many common problems that could come up, but that, although the association is proceeding slowly, he believed it would accomplish worthwhile things. "I know you are wondering what we are going to do and what we are doing," he said. "I believe this association is going to do for this important industry everything that can be done for the industry within the industry."

Study of Frozen Per Diem Plan Nearing Completion

A.A.R. directing investigation of proposal as possible substitute for car pooling

Under the direction of the Association of American Railroads, railroads of the country are making a detailed study, now nearly completed, of the universal application of a frozen per diem plan as a possible substitute for the car pooling plan recommended by Co-ordinator Eastman's organization. The plan contemplates the ascertainment of the actual number of days cars of one line have been located on another, as the average for the corresponding months of three previous years, and allowing roads to hold cars of others for such loading as may be available or in prospect, paying the same amount of per diem per car monthly as was paid prior to the agreement becoming effective.

This avoids the movement of empty cars home to save per diem expense, and the payment may be based on the average for each owning road or the average for all roads. Such a plan has been in effect for some time by special agreements between the Pennsylvania and the New Haven, between the New Haven and the Boston & Maine and between the Boston & Maine, the Maine Central and the Bangor & Aroostook, resulting in large savings in interchange of empty cars. Broadening of the plan was recommended by the general committee of the transportation division of the American Railway Association last summer but the Car Pooling Section of the Co-ordinator's organization has regarded it as only a partial remedy for the problem.

A detailed study of the plan was authorized some time ago by the board of directors of new railroad association, but a final report is yet to be submitted and the plan has not yet been definitely approved by the directors.

President Plans Transport Message Within Next Week

President Roosevelt plans to transmit to Congress in about a week a message dealing with the principle of co-ordinating regulation of all forms of transportation in a single body.

W. T. L. Class Rates Postponed

On petition of the railroads the Interstate Commerce Commission has postponed the effective date of its order of October 9, 1934, prescribing a revision of class rates in western trunk line territory, from March 20 to July 20.

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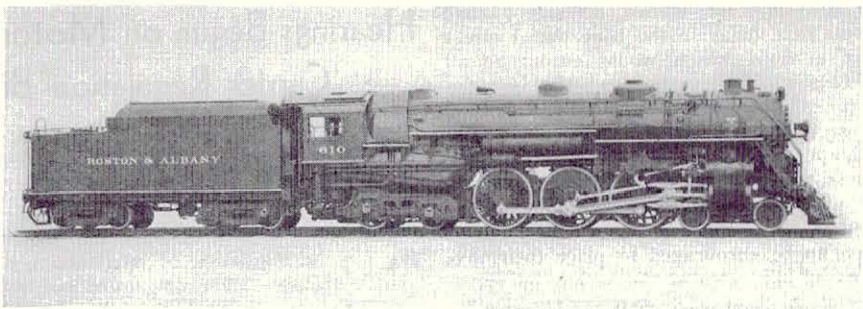

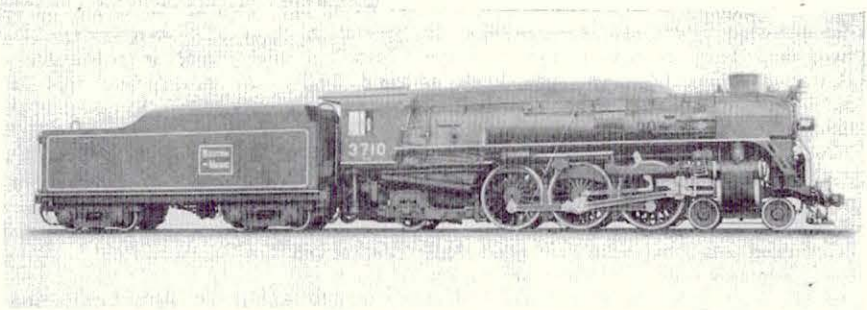

PASSENGER SERVICE

Long distance, high speed passenger service, embodying every travel comfort, is available in the United States on a scale not approached in any other country.

This service has been made possible and is maintained by modern super-power steam locomotives.

LIMA LOCOMOTIVE WORKS INCORPORATED

LIMA LOCOMOTIVE WORKS INCORPORATED, LIMA, OHIO

Railroads Should Justify Private Control Verdict

What is done in the next year or two should support Eastman's finding, says Bruere

Having got Co-ordinator Eastman's verdict against government ownership, the railroad industry should justify that verdict by what is done in the next year or two, said Henry Bruere, president of the Bowery Savings Bank of New York in an address at the February 15 noon-day luncheon meeting of the Traffic Club of New York. The savings banks and other institutional investors, Mr. Bruere said, are not dismal as to the outlook for railroad securities which they hold but they are determined that some permanent good shall flow from Co-ordinator Eastman's study "which is a masterly presentation of a great subject, whether or not we agree in detail."

"If the Co-ordinator's recommendations are adopted, if the Association of American Railroads functions," he continued, "then we need not call upon the government to rescue the railroads. We do not intend endlessly to come to the door of the United States Treasury to be relieved of our debts and cured of our mistakes."

Listing the elements in the current railroad problem, Mr. Bruere held that in solving it the country must at the same time solve its transport problem, and in this connection public opinion must be convinced that measures which are proposed by the railroads will be in the public interest and fair to other agencies. The speaker expressed his belief that an understanding could be reached with highway carriers since motor transport needs to be stabilized because it is a rapidly developing industry that will soon want to go to the public for financing. On the question of railroad labor costs, he sees the need for "some way of getting realism into the minds of our friends among the brotherhoods." These labor leaders, he said, are able men but there is a now wide chasm between their approach and the way in which other interests approach the transportation problem; and "We have not been able to get over the idea that our interests are identical."

Mr. Bruere, who, as stated in the foregoing, endorsed the findings of the co-ordinator in general, later referred specifically to the recommendation for a permanent co-ordinator. Pointing out that, although the railroads do not want vested in a permanent co-ordinator the authority to issue orders, the speaker, nevertheless, felt that there will be a future need on the part of railroads for an impartial agency in the government to which they can go for public endorsement of their recommendations. In other words, he said, this country's transport system so far as rail carriers are concerned must involve a railroad system adequately financed and with right public relations and right relations with the government.

"This year is the year for affirmative action," Mr. Bruere said in closing. "It is the time for unified action. I have come here today in the hope that I might say a word which would encourage all parties to the situation, whether government, shippers, operators, or investors, to unite in establishing for America a unified transportation policy that will warrant those who have labor or executive service to give, to see ahead a stable and secure source of livelihood, those who frugally save to be encouraged to place their savings at fair rates at the service of transportation, those who travel to travel comfortably, quickly and at reasonable ease, and finally, the government that is the common servant of us all, to establish the basis in law under which we may preserve that which frugality and labor have achieved, and continue to develop for the welfare of the nation a transportation system that will strengthen, unify and upbuild the nation."

Railroad Labor to Ask Limitation on Dismissals

The Railway Labor Executives' Association has been holding meetings in Washington for the purpose of planning its campaign for its own legislative proposals intended to increase employment and also its position in relation to the legislative proposals of Co-Ordinator Eastman. George M. Harrison, chairman of the association, said that the labor organizations would "appeal to Congress to write into any railroad legislation it may pass a provision similar to the section of the emergency transportation act of 1933 which undertakes to stabilize railroad employment as of a certain date." Mr. Eastman has recommended in place of this provision a system of dismissal compensation for employees displaced by co-ordination projects.

Railroad Bonds Payable in "New Deal" Dollars

Suits against two railroad companies were involved in the momentous decisions of the Supreme Court of the United States on February 18 on the "gold clause," sustaining, so far as private contracts are concerned, the validity of the Congressional resolution of June 5, 1933, which declared that all public or private debts should be satisfied by payment in legal tender money in spite of provisions in the contracts making them payable in gold of the standard of weight and fineness prevailing when the contracts were made. A holder of a Baltimore & Ohio bond had demanded $38.10 in currency as the equivalent of the $22.50 in gold, which his interest coupon provided for, and trustees for bondholders of the St. Louis, Iron Mountain & Southern had demanded payment in gold or its currency equivalent at the "new deal" value of gold. The court, by a 5 to 4 decision, while holding the Congressional resolution invalid in so far as it sought to repudiate the government's promise to pay Liberty Loan bonds in gold, held that Congress in the exercise of its power to regulate currency could not be controlled by the gold clause in private obligations, and that the bondholders were not damaged by being paid dollar for dollar in currency.

Hearings Begun on Motor Carrier Regulation Bill

Legislation urged by Co-ordinator Eastman, I.C.C. and state commissioners

Prompt enactment of legislation providing for the regulation of interstate motor vehicle transportation was urged before a sub-committee of the House committee on interstate and foreign commerce on February 19 by Joseph B. Eastman, federal co-ordinator of transportation, Frank McManamy, chairman of the legislative committee of the Interstate Commerce Commission, Robert H. Dunn, chairman of the committee on motor vehicle legislation of the National Association of Railroad and Utilities Commissioners, and H. L. Hooker, chairman of the legislative committee of that association. The testimony was given at the opening hearing on the bill recommended by Co-ordinator Eastman and introduced by Representative Huddleston, who is chairman of the sub-committee, as H.R.5262. Hearings on this and other bills recommended by Mr. Eastman are to begin next week before the Senate committee on interstate commerce but there is said to be a possibility that the water carrier bill recommended by Mr. Eastman may be referred to the House merchant marine committee.

Mr. Eastman made an opening statement, summarizing some of the reasons given in his reports for recommending a comprehensive program of transportation legislation and emphasizing the fact that we have an over-supply of transportation and that the problem is a transportation problem, not merely a railroad problem. He said there was no purpose to restrict the proper development of motor transportation but that the object was to introduce a greater degree of order and stability and eliminate the chaos that now exists. He said he recognized the difficulties in the way but that the important thing is to get under way and that he was confident that a practicable way will be found. He said that registrations of for-hire trucks under the code for the truck industry had now reached a total of 303,000, of which it was estimated that about 70,000 are common carriers and 190,000 contract carriers.

Questions asked by the Congressmen indicated no particular enthusiasm for the bill but rather concern as to whether regulation would not have the effect of increasing truck rates and stifling the development of an industry which the witnesses indicated they thought was greatly over-developed now in some ways. Mr. Eastman said he did not believe regulation would result in substantial increases in rates but said that it would probably result in increasing some rates that are uneconomically low. He said that if any form of transportation is able to put the railroads out of business as the railroads did the stage-coach it ought to have the opportunity but he did not think the railroads would be put out of business.

Commissioner McManamy suggested

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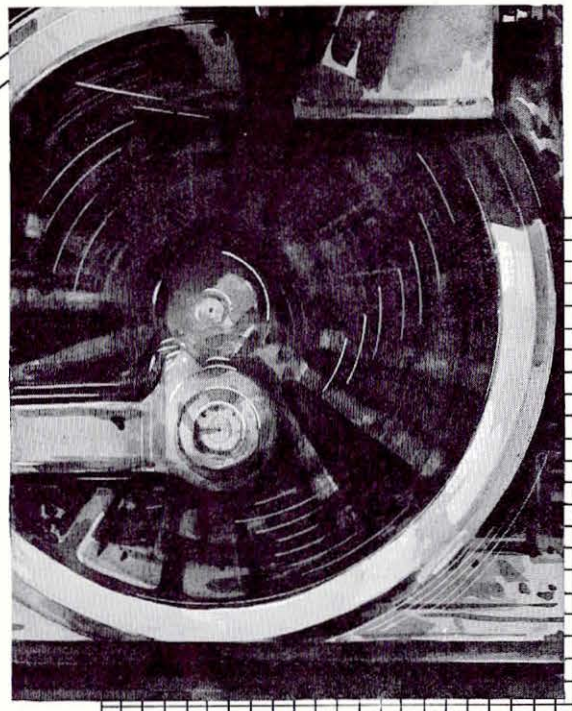


SPINNING DRIVERS

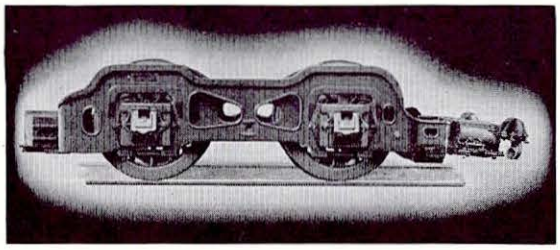
DRIVE UP MAINTENANCE

Just a few revolutions of slipping drivers cost more for maintenance than many miles of normal travel. « This abuse is completely avoided on Booster power. The extra pull the Booster adds for starting and over the hard spots renders slipping drivers unnecessary. « Aside from the possibility of hauling a heavier train, the saving in locomotive maintenance that the Booster brings, more than pays for the Booster in a short time. « And, reduced maintenance automatically brings with it a correspondingly increased availability of power for road service.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

Because material and tolerances are just right for the job, genuine Franklin repair parts give maximum service life



two amendments to the bill which the commission thought would improve it but said that whether or not they are accepted the commission believes that public interest requires its passage and that discussion of them should not be permitted to delay or prevent the enactment of the bill. He referred to the commission's reports uniformly holding that regulation of motor vehicles was desirable in the public interest and said that in the hearings and investigations the testimony of the parties interested as well as the sentiment of the public has been overwhelmingly in support of adequate regulation, while substantial agreement seems to have been reached as to the form of such regulation. Regarding the proposed amendments he said:

"In section 302 of H. R. 5262 there is a provision similar to that in other bills that it is not intended to interfere with the exclusive exercise by each state of the power to regulate intrastate commerce. This is followed by a proviso that it shall not be construed to prevent the commission from exercising its authority to protect persons and localities in interstate

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled From 147 Monthly Reports of Revenues and Expenses Representing 149 Class I Steam Railways

FOR THE MONTH OF DECEMBER, 1934 AND 1933

Item	United States		Eastern District		Southern District		Western District	
	1934	1933	1934	1933	1934	1933	1934	1933
Average number of miles operated	238,538	239,830	59,137	59,264	45,312	45,569	134,089	134,997
Revenues:								
Freight	$199,356,370	$191,668,329	$86,917,787	$82,172,794	$40,998,808	$39,325,577	$71,439,775	$70,169,958
Passenger	32,016,181	29,311,655	18,343,273	17,962,271	4,479,580	3,670,556	9,193,328	7,678,828
Mail	9,336,543	9,380,622	3,474,673	3,584,492	1,601,854	1,585,503	4,260,016	4,210,627
Express	4,844,480	4,223,000	1,781,793	1,540,681	1,107,145	890,566	1,955,542	1,791,753
All other transportation	6,273,444	5,586,449	3,289,223	3,004,606	606,879	567,498	2,377,342	2,014,345
Incidental	5,112,684	4,491,844	2,801,757	2,449,858	802,219	689,981	1,508,708	1,352,005
Joint facility—Cr.	740,861	871,214	245,016	222,775	157,880	267,209	337,965	381,230
Joint facility—Dr.	174,805	186,155	46,010	46,291	15,490	14,396	113,305	125,468
Railway operating revenues	257,505,758	245,346,958	116,807,512	110,891,186	49,738,875	46,982,494	90,959,371	87,473,278
Expenses:								
Maintenance of way and structures	25,334,540	23,033,829	10,094,378	9,443,184	4,804,803	4,218,078	10,435,359	9,372,567
Maintenance of equipment*	48,614,731	50,476,834	21,598,312	23,387,635	9,410,590	9,201,439	17,605,829	17,887,760
Traffic	7,472,531	7,288,405	2,766,772	2,661,514	1,561,609	1,396,224	3,144,150	3,230,667
Transportation	98,273,164	92,379,096	45,373,301	43,662,493	16,462,876	15,124,900	36,436,987	33,591,703
Miscellaneous operations	2,422,250	2,180,142	1,207,754	1,140,575	299,634	240,812	914,862	798,755
General	a 13,686,411	b 12,178,922	6,279,169	5,407,886	1,697,606	2,069,794	5,709,636	4,701,242
Transportation for investment—Cr.	452,359	438,824	200,104	129,616	41,283	54,697	210,972	254,511
Railway operating expenses	195,351,268	187,098,404	87,119,582	85,573,671	34,195,835	32,196,550	74,035,851	69,328,183
Net revenue from railway operations	62,154,490	58,248,554	29,687,930	25,317,515	15,543,040	14,785,944	16,923,520	18,145,095
Railway tax accruals	13,699,773	11,273,450	6,187,816	5,587,797	2,639,605	2,068,233	4,872,352	3,617,420
Uncollectible railway revenues	159,527	155,757	91,726	46,012	34,929	37,174	32,872	72,571
Railway operating income	48,295,190	46,819,347	23,408,388	19,683,706	12,868,506	12,680,537	12,018,296	14,455,104
Equipment rents—Dr. balance	6,483,531	6,695,692	3,208,338	3,587,125	300,405	234,668	2,974,788	2,873,899
Joint facility rent—Dr. balance	3,073,364	2,397,314	1,924,742	1,567,942	349,046	245,237	799,576	584,135
Net railway operating income	38,738,295	37,726,341	18,275,308	14,528,639	12,219,055	12,200,632	8,243,932	10,997,070
Ratio of expenses to revenues (per cent)	75.86	76.26	74.58	77.17	68.75	68.53	81.39	79.26
* Includes:								
Depreciation	14,560,914	14,936,481	6,203,110	6,211,573	2,910,777	2,917,262	5,447,027	5,807,646
Retirements	867,199	1,959,405	420,748	684,091	274,761	646,845	171,690	628,469

FOR TWELVE MONTHS ENDED WITH DECEMBER, 1934 AND 1933

Average number of miles operated	239,052	240,837	59,149	59,510	45,405	45,738	134,498	135,589
Revenues:								
Freight	$2,633,386,912	$2,492,893,539	$1,120,228,737	$1,062,461,409	$521,052,469	$503,275,831	$992,105,706	$927,156,299
Passenger	346,220,277	329,341,891	206,336,090	197,408,671	44,750,697	38,850,879	95,133,490	93,082,341
Mail	91,139,614	91,870,406	35,157,086	35,929,516	15,994,669	15,787,060	39,987,859	40,153,830
Express	54,012,058	45,639,980	22,290,018	19,867,247	10,741,933	8,690,791	20,980,107	17,081,942
All other transportation	75,434,524	71,803,267	38,781,454	39,578,481	7,196,753	6,458,143	29,456,317	25,766,643
Incidental	64,296,463	57,767,778	34,386,065	31,965,986	9,374,782	8,270,103	20,535,616	17,531,689
Joint facility—Cr.	9,194,704	8,565,473	2,887,521	2,712,253	2,097,253	1,957,364	4,209,930	3,895,856
Joint facility—Dr.	2,238,079	2,261,604	591,651	618,553	197,109	224,258	1,449,319	1,418,793
Railway operating revenues	3,271,446,473	3,095,620,730	1,459,475,320	1,389,305,010	611,011,447	583,065,913	1,200,959,706	1,123,249,807
Expenses:								
Maintenance of way and structures	365,285,353	322,386,146	144,714,945	129,490,313	70,506,005	63,062,332	150,064,403	129,833,501
Maintenance of equipment†	637,896,970	598,770,464	284,692,378	270,533,329	121,358,152	113,060,932	231,846,440	215,176,203
Traffic	89,249,160	85,826,767	33,777,318	32,036,175	17,147,479	16,240,330	38,324,363	37,550,262
Transportation	1,164,037,104	1,078,093,344	541,424,341	501,555,625	194,200,835	180,571,261	428,411,928	395,966,458
Miscellaneous operations	27,021,460	23,546,135	13,098,868	11,885,741	3,152,365	2,655,299	10,770,227	9,005,095
General	c 161,526,876	d 143,862,006	70,098,417	62,275,915	26,299,222	24,507,017	65,129,237	57,079,074
Transportation for investment—Cr.	3,244,585	2,949,263	1,005,774	1,013,203	335,998	346,558	1,902,813	1,589,502
Railway operating expenses	2,441,772,338	2,249,535,599	1,086,800,493	1,006,763,895	432,328,060	399,750,613	922,643,785	843,021,091
Net revenue from railway operations	829,674,135	846,085,131	372,674,827	382,541,115	178,683,387	183,315,300	278,315,921	280,228,716
Railway tax accruals	239,498,394	249,645,344	101,234,951	104,532,743	47,124,323	47,207,485	91,139,120	97,905,116
Uncollectible railway revenues	1,166,240	1,208,379	605,183	520,008	195,225	163,257	365,832	525,114
Railway operating income	589,009,501	595,231,408	270,834,693	277,488,364	131,363,839	135,944,558	186,810,969	181,798,486
Equipment rents—Dr. balance	89,841,701	85,044,693	43,821,661	44,048,778	5,686,556	4,213,583	40,333,484	36,782,332
Joint facility rent—Dr. balance	36,460,890	35,974,411	20,430,571	19,802,107	4,420,876	3,920,120	11,609,443	12,252,184
Net railway operating income	462,706,910	474,212,304	206,582,461	213,637,479	121,256,407	127,810,855	134,868,042	132,763,970
Ratio of expenses to revenues (per cent)	74.64	72.67	74.47	72.47	70.76	68.56	76.83	75.05
† Includes:								
Depreciation	183,949,771	180,926,987	81,117,455	72,411,572	34,788,275	35,881,695	68,044,041	72,633,720
Retirements	5,128,156	15,302,988	1,138,381	10,543,309	2,221,980	1,743,509	1,767,795	3,016,170

a Includes accruals on account of pensions, as follows: Under Federal Retirement Act, $1,831,990; under previously existing plan, $2,841,159, but excludes pension accruals held in suspense and not charged to operating expenses.

b Includes accruals on account of pensions, under previously existing plan, $2,869,001.

c Includes accruals on account of pensions, as follows: Under Federal Retirement Act, $15,168,802; under previously existing plan, $35,284,280, but excludes pension accruals held in suspense and not charged to operating expenses.

d Includes accruals on account of pensions, under previously existing plan, $33,598,300.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

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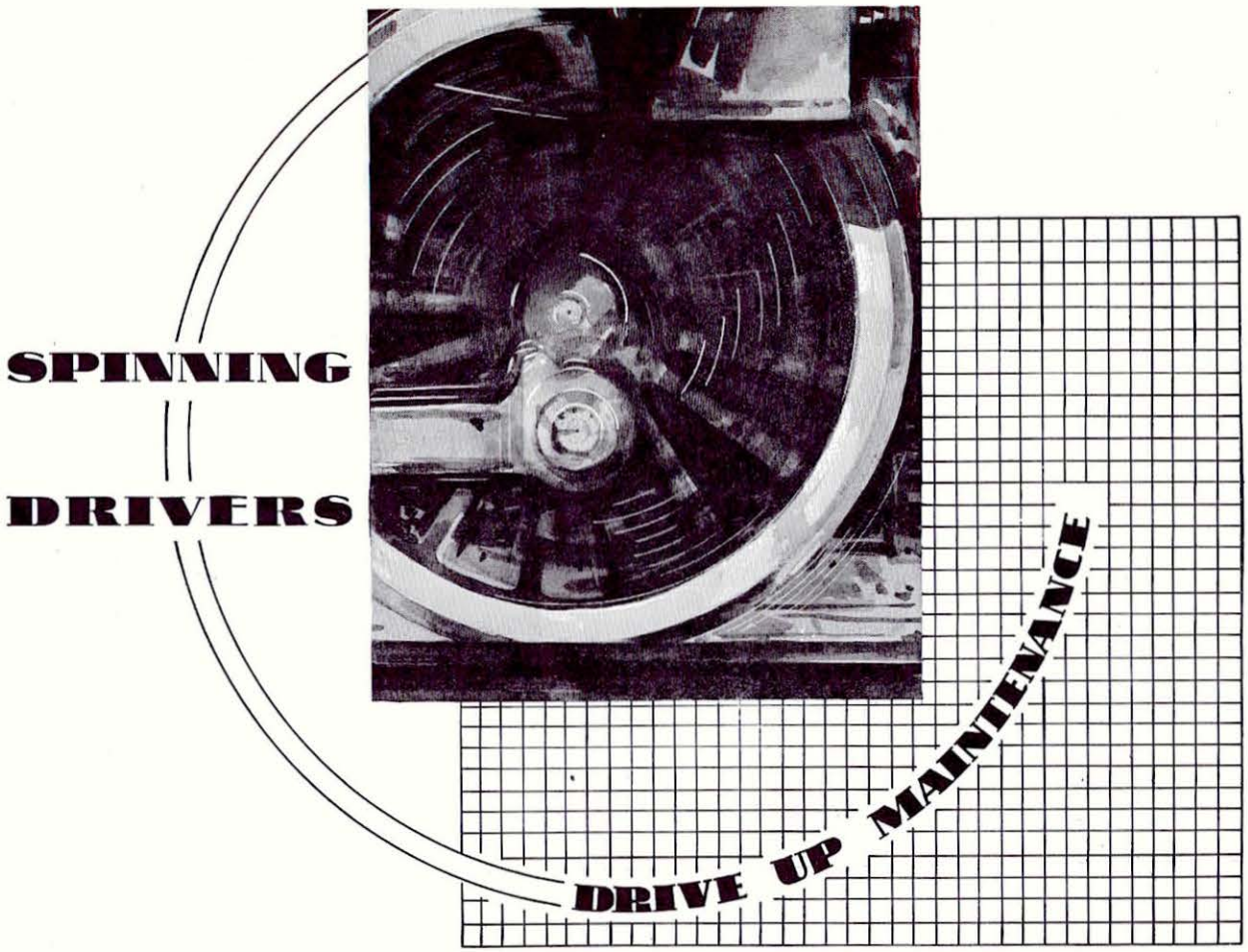
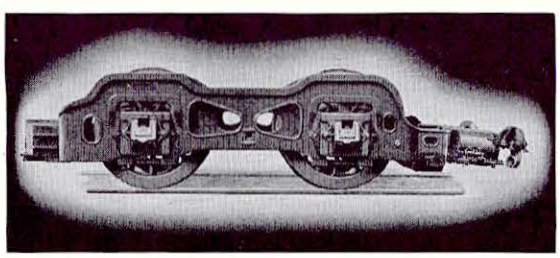


Just a few revolutions of slipping drivers cost more for maintenance than many miles of normal travel. « This abuse is completely avoided on Booster power. The extra pull the Booster adds for starting and over the hard spots renders slipping drivers unnecessary. « Aside from the possibility of hauling a heavier train, the saving in locomotive maintenance that the Booster brings, more than pays for the Booster in a short time. « And, reduced maintenance automatically brings with it a correspondingly increased availability of power for road service.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

Because material and tolerances are just right for the job, genuine Franklin repair parts give maximum service life



two amendments to the bill which the commission thought would improve it but said that whether or not they are accepted the commission believes that public interest requires its passage and that discussion of them should not be permitted to delay or prevent the enactment of the bill. He referred to the commission's reports uniformly holding that regulation of motor vehicles was desirable in the public interest and said that in the hearings and investigations the testimony of the parties interested as well as the sentiment of the public has been overwhelmingly in support of adequate regulation, while substantial agreement seems to have been reached as to the form of such regulation. Regarding the proposed amendments he said:

"In section 302 of H. R. 5262 there is a provision similar to that in other bills that it is not intended to interfere with the exclusive exercise by each state of the power to regulate intrastate commerce. This is followed by a proviso that it shall not be construed to prevent the commission from exercising its authority to protect persons and localities in interstate

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled From 147 Monthly Reports of Revenues and Expenses Representing 149 Class I Steam Railways

FOR THE MONTH OF DECEMBER, 1934 AND 1933

Item	United States		Eastern District		Southern District		Western District	
	1934	1933	1934	1933	1934	1933	1934	1933
Average number of miles operated	238,538	239,830	59,137	59,264	45,312	45,569	134,089	134,997
Revenues:								
Freight	$199,356,370	$191,668,329	$86,917,787	$82,172,794	$40,998,808	$39,325,577	$71,439,775	$70,169,958
Passenger	32,016,181	29,311,655	18,343,273	17,962,271	4,479,580	3,670,556	9,193,328	7,678,828
Mail	9,336,543	9,380,622	3,474,673	3,584,492	1,601,854	1,585,503	4,260,016	4,210,627
Express	4,844,480	4,223,000	1,781,793	1,540,681	1,107,145	890,566	1,955,542	1,791,753
All other transportation	6,273,444	5,586,449	3,289,223	3,004,606	606,879	567,498	2,377,342	2,014,345
Incidental	5,112,684	4,491,844	2,801,757	2,449,858	802,219	689,981	1,508,708	1,352,005
Joint facility—Cr.	740,861	871,214	245,016	222,775	157,880	267,209	337,965	381,230
Joint facility—Dr.	174,805	186,155	46,010	46,291	15,490	14,396	113,305	125,468
Railway operating revenues	257,505,758	245,346,958	116,807,512	110,891,186	49,738,875	46,982,494	90,959,371	87,473,278
Expenses:								
Maintenance of way and structures	25,334,540	23,033,829	10,094,378	9,443,184	4,804,803	4,218,078	10,435,359	9,372,567
Maintenance of equipment*	48,614,731	50,476,834	21,598,312	23,387,635	9,410,590	9,201,439	17,605,829	17,887,760
Traffic	7,472,531	7,288,405	2,766,772	2,661,514	1,561,609	1,396,224	3,144,150	3,230,667
Transportation	98,273,164	92,379,096	45,373,301	43,662,493	16,462,876	15,124,900	36,436,987	33,591,703
Miscellaneous operations	2,422,250	2,180,142	1,207,754	1,140,575	299,634	240,812	914,862	798,755
General	a 13,686,411	b 12,178,922	6,279,169	5,407,886	1,697,606	2,069,794	5,709,636	4,701,242
Transportation for investment—Cr.	452,359	438,824	200,104	129,616	41,283	54,697	210,972	254,511
Railway operating expenses	195,351,268	187,098,404	87,119,582	85,573,671	34,195,835	32,196,550	74,035,851	69,328,183
Net revenue from railway operations	62,154,490	58,248,554	29,687,930	25,317,515	15,543,040	14,785,944	16,923,520	18,145,095
Railway tax accruals	13,699,773	11,273,450	6,187,816	5,587,797	2,639,605	2,068,233	4,872,352	3,617,420
Uncollectible railway revenues	159,527	155,757	91,726	46,012	34,929	37,174	32,872	72,571
Railway operating income	48,295,190	46,819,347	23,408,388	19,683,706	12,868,506	12,680,537	12,018,296	14,455,104
Equipment rents—Dr. balance	6,483,531	6,695,692	3,208,338	3,587,125	300,405	234,668	2,974,788	2,873,899
Joint facility rent—Dr. balance	3,073,364	2,397,314	1,924,742	1,567,942	349,046	245,237	799,576	584,135
Net railway operating income	38,738,295	37,726,341	18,275,308	14,528,639	12,219,055	12,200,632	8,243,932	10,997,070
Ratio of expenses to revenues (per cent)	75.86	76.26	74.58	77.17	68.75	68.53	81.39	79.26
* Includes:								
Depreciation	14,560,914	14,936,481	6,203,110	6,211,573	2,910,777	2,917,262	5,447,027	5,807,646
Retirements	867,199	1,959,405	420,748	684,091	274,761	646,845	171,690	628,469

FOR TWELVE MONTHS ENDED WITH DECEMBER, 1934 AND 1933

Average number of miles operated	239,052	240,837	59,149	59,510	45,405	45,738	134,498	135,589
Revenues:								
Freight	$2,633,386,912	$2,492,893,539	$1,120,228,737	$1,062,461,409	$521,052,469	$503,275,831	$992,105,706	$927,156,299
Passenger	346,220,277	329,341,891	206,336,090	197,408,671	44,750,697	38,850,879	95,133,490	93,082,341
Mail	91,139,614	91,870,406	35,157,086	35,929,516	15,994,669	15,787,060	39,987,859	40,153,830
Express	54,012,058	45,639,980	22,290,018	19,867,247	10,741,933	8,690,791	20,980,107	17,081,942
All other transportation	75,434,524	71,803,267	38,781,454	39,578,481	7,196,753	6,458,143	29,456,317	25,766,643
Incidental	64,296,463	57,767,778	34,386,065	31,965,986	9,374,782	8,270,103	20,535,616	17,531,689
Joint facility—Cr.	9,194,704	8,565,473	2,887,521	2,712,253	2,097,253	1,957,364	4,209,930	3,895,856
Joint facility—Dr.	2,238,079	2,261,604	591,651	618,553	197,109	224,258	1,449,319	1,418,793
Railway operating revenues	3,271,446,473	3,095,620,730	1,459,475,320	1,389,305,010	611,011,447	583,065,913	1,200,959,706	1,123,249,807
Expenses:								
Maintenance of way and structures	365,285,353	322,386,146	144,714,945	129,490,313	70,506,005	63,062,332	150,064,403	129,833,501
Maintenance of equipment†	637,896,970	598,770,464	284,692,378	270,533,329	121,358,152	113,060,932	231,846,440	215,176,203
Traffic	89,249,160	85,826,767	33,777,318	32,036,175	17,147,479	16,240,330	38,324,363	37,550,262
Transportation	1,164,037,104	1,078,093,344	541,424,341	501,555,625	194,200,835	180,571,261	428,411,928	395,966,458
Miscellaneous operations	27,021,460	23,546,135	13,098,868	11,885,741	3,152,365	2,655,299	10,770,227	9,005,095
General	c 161,526,876	d 143,862,006	70,098,417	62,275,915	26,299,222	24,507,017	65,129,237	57,079,074
Transportation for investment—Cr.	3,244,585	2,949,263	1,005,774	1,013,203	335,998	346,558	1,902,813	1,589,502
Railway operating expenses	2,441,772,338	2,249,535,599	1,086,800,493	1,006,763,895	432,328,060	399,750,613	922,643,785	843,021,091
Net revenue from railway operations	829,674,135	846,085,131	372,674,827	382,541,115	178,683,387	183,315,300	278,315,921	280,228,716
Railway tax accruals	239,498,394	249,645,344	101,234,951	104,532,743	47,124,323	47,207,485	91,139,120	97,905,116
Uncollectible railway revenues	1,166,240	1,208,379	605,183	520,008	195,225	163,257	365,832	525,114
Railway operating income	589,009,501	595,231,408	270,834,693	277,488,364	131,363,839	135,944,558	186,810,969	181,798,486
Equipment rents—Dr. balance	89,841,701	85,044,693	43,821,661	44,048,778	5,686,556	4,213,583	40,333,484	36,782,332
Joint facility rent—Dr. balance	36,460,890	35,974,411	20,430,571	19,802,107	4,420,876	3,920,120	11,609,443	12,252,184
Net railway operating income	462,706,910	474,212,304	206,582,461	213,637,479	121,256,407	127,810,855	134,868,042	132,763,970
Ratio of expenses to revenues (per cent)	74.64	72.67	74.47	72.47	70.76	68.56	76.83	75.05
† Includes:								
Depreciation	183,949,771	180,926,987	81,117,455	72,411,572	34,788,275	35,881,695	68,044,041	72,633,720
Retirements	5,128,156	15,302,988	1,138,381	10,543,309	2,221,980	1,743,509	1,767,795	3,016,170

a Includes accruals on account of pensions, as follows: Under Federal Retirement Act, $1,831,990; under previously existing plan, $2,841,159, but excludes pension accruals held in suspense and not charged to operating expenses.

b Includes accruals on account of pensions, under previously existing plan, $2,869,001.

c Includes accruals on account of pensions, as follows: Under Federal Retirement Act, $15,168,802; under previously existing plan, $35,284,280, but excludes pension accruals held in suspense and not charged to operating expenses.

d Includes accruals on account of pensions, under previously existing plan, $33,598,300.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

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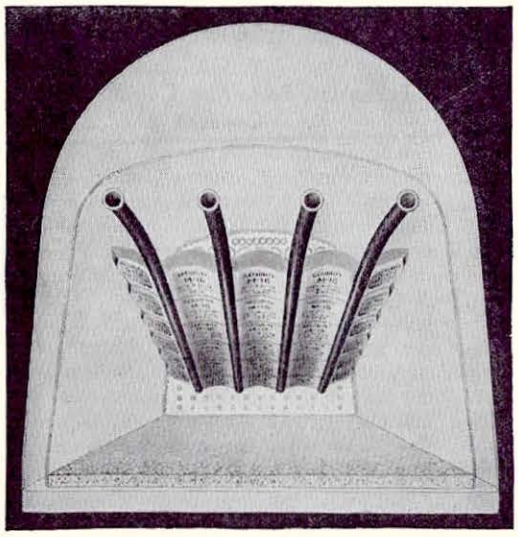
The Brick of YESTERDAY Won't Do Today

There's More to
SECURITY ARCHES
Than Just Brick



Locomotive service has always been a severe service for any material or equipment.

It is today many times as gruelling as it was a decade ago.

Locomotives operate over longer continuous runs at higher speeds with far heavier trains.

For the same reason, economy factors on the locomotive give correspondingly greater returns.

Maintaining such factors at their full efficiency is necessary to get these returns.

Security Arches, measured in terms of locomotive output, give greater service than at any time in their history.

But — for full economy be sure a complete arch is applied at every boiler wash.

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists

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commerce from discrimination or prejudice caused by intrastate rates. This provision may be adequate to protect persons and localities from the discrimination referred to but it seems to me that the provision in S. 394 is more definite and therefore more workable.

"The other amendment to which I refer I think is more important because it relates to safety. In section 2 (a) (1) and (2) of S. 394 there are provisions authorizing the commission to establish reasonable requirements with respect to certain matters including 'qualifications and maximum hours of service of employees.' Somewhat similar provisions appear in H. R. 5262, but they omit the words above quoted. Instead section 325 authorizes the commission to investigate and report on the need for such regulation. Further investigation of the need for regulation of the hours of service of employees engaged in interstate transportation should hardly be necessary because the hours of service of railroad employees have been regulated by law for 27 years and it has proven to be one of the most important provisions of all of the safety legislation. The regulation of the hours of service of bus and truck operators is far more important from a safety standpoint than the regulation of the hours of service of railroad employees because the danger is greater. A further reason is that the regulations of many of the states contain such provisions and it would be unfair to allow interstate carriers to operate in disregard of such provisions. It is my view, therefore, that definite hours of service provisions should be included in the bill. This could be accomplished by inserting in section 304 (a) (1) and (2), lines 9 and 15, page 8, following the word 'records' in both lines, the words which appear in S. 394 as follows: 'qualifications and maximum hours of service of employees.'"

Mr. Dunn said that the state commissioners were in favor of the principal features of the bill but desired one or two amendments which would be presented by later witnesses. He favored establishment of minimum rates for contract trucks. He said he had heard of no complaint of lack of truck transportation but many complaints of the lack of dependable truck transportation and, referring to the large number of trucks operating daily between Chicago and Detroit, 286 miles, taking 15 hours on the road and an hour and one-half at each end for pick-up and delivery, he said: "If that is modern transportation it is time when there should be corrective legislation."

Mr. Hooker spoke particularly in opposition to the commission's suggestion that the "Shreveport doctrine" be included in the bill, saying that it would destroy state commission control over motor carriers and that he thought the commission was placing itself in a ridiculous position in wanting such jurisdiction.

C. G. W. Coach Tickets Good in Tourist Sleepers

A new bid for passenger traffic between Chicago and the Twin Cities will be made by the Chicago Great Western on March 3 when coach rates will be honored in tourist sleeping cars. Under the experiment, which will be continued for six months, the carrier will operate tourist sleeping cars instead of standard sleeping cars between these cities and the patron will be able to enjoy sleeping accommodations for two cents a mile (or on the round trip rate of 1.8 cents) plus the tourist sleeping car fare of $1.25, which is only half the standard sleeping carfare. The plan was submitted to the western trunk lines early this year, and was opposed. Following this action the road filed its tariff and its proposal was approved by H. G. Taylor, co-ordinator for the western lines, as a worthwhile experiment. The trains offering those cars are those leaving Chicago at 7:30 p. m. and Minneapolis at 8:20 p. m.

Frisco Builds Combination Sleeping Cars

The St. Louis-San Francisco has built two combination sleeper-buffet-coach cars, the "Memphis" and the "Pensacola" which have been placed in service between Memphis, Tenn., and Pensacola, Fla. In the construction of these converted cars welding instead of riveting has been employed so that there are no rivets in the sides or roofs. The cars contain six sleeping sections, the service for which is provided by the railroad, a buffet in the center of the car which is capable of seating 12 people, and a coach section which seats 30 people. Each car is air conditioned throughout, with two separate cooling units, one in each end of the car. The overhead heat is controlled by thermostats. These cars were under construction at the Frisco's West Shops at Springfield, Mo., for five and one-half months. Two all welded, combination mail and baggage cars for this service are now under construction and will be placed in operation some time during March.

I.C.C. Passenger Fare Investigation

Hearings before Commissioner Porter and Examiner Koch of the Interstate Commerce Commission in connection with the commission's investigation of railroad passenger fares were continued this week. Following testimony by representatives of southern roads counsel for the eastern railroads moved to strike from the record statistical material from the passenger traffic report prepared by the Co-ordinator's Section of Transportation Service and some parts of the material were omitted at the hearing on February 16.

A. F. White, assistant director of the Section of Transportation Service, put into the record an additional exhibit covering passenger traffic statistics for the three regions through eleven months of 1934, showing a large and steady increase in the number of coach passengers from month to month on the group of roads in the Southern district which maintained the rate of one and one-half cents a mile in coaches. For November the index for the number of passengers carried was 210 as compared with the average for corresponding months in the years 1931, 1932, and 1933, and for the eleven months it was 185, whereas the western roads having a two-cent fare showed an index of 107 and the eastern district, with a basic fare of 3.6 cents, showed an index of 96. Roads in the southern district having a two-cent fare showed an index of 127.

Mr. White was subjected to a lengthy cross-examination by counsel for the railroads, who sought to show that many of the statistical exhibits on the passenger traffic report, although based on figures furnished by the railroads, were compiled on bases which they did not approve.

Particular attention was paid to a tabulation in the report indicating that the mail service was the only branch of the railway passenger-train business to show a slight profit and telegrams exchanged between J. R. Turney, director of the Section, and W. A. Worthington, chairman of the National Railway Mail Pay Committee, were read to show that the committee had protested against methods proposed to be used by the section in apportioning the space devoted to mail in passenger train cars as being unfair to the railroads. Mr. White said that the methods were changed somewhat after the exchange of telegrams and that he had not known of any objection by the committee after the change was made. In one of the telegrams Mr. Turney said that the possibility of the misuse of the figures for other purposes ought not to interfere with an estimate of the apportionment of space in trains for various purposes.

N. Y. C. Streamlined Locomotive in Regular Service

The New York Central's streamlined steam locomotive—the Commodore Vanderbilt—made its first run in regular service on February 19 when it hauled the first section of the Twentieth Century Limited from Chicago to Toledo, Ohio, 233 mi. On February 20 it hauled the westbound Century from Toledo to Chicago and will continue on this assignment for the present.

The Commodore Vanderbilt, which was described in the *Railway Age* of December 22, 1934, has recently completed an exhibition tour.

Extension Requiring Commission's Consent

Affirming a decree of the Federal District Court for eastern Arkansas, the Eighth Circuit Court of Appeals granted an injunction to the St. Louis Southwestern restraining the Missouri Pacific from constructing a line about 2,100 ft. long to certain plants in North Little Rock, already served by the St. Louis Southwestern and the Rock Island, without a certificate of convenience and necessity from the Interstate Commerce Commission. The Missouri Pacific already moves freight to these industries, but it has to be carried over the lines of one of the other roads. The court held that the proposed extension, nearly a mile long, into territory in which the Missouri Pacific has no trackage, and which is now and for the future will be adequately served by other carriers, is an extension of the Missouri Pacific's railroad within paragraph 18 of section 1 of the Interstate Commerce Act, requiring the consent of the Commission to its construction, and not a mere spur, industrial, team, switching or side track, within paragraph 22.

Continued on next left-hand page

An Injector Boiler Feed

for *Increased* Capacity and Economy

To those railroad men who want the increased capacity and economy afforded by exhaust-steam feed water heating — yet prefer the injector type of boiler feed — we offer the Elesco exhaust steam injector.

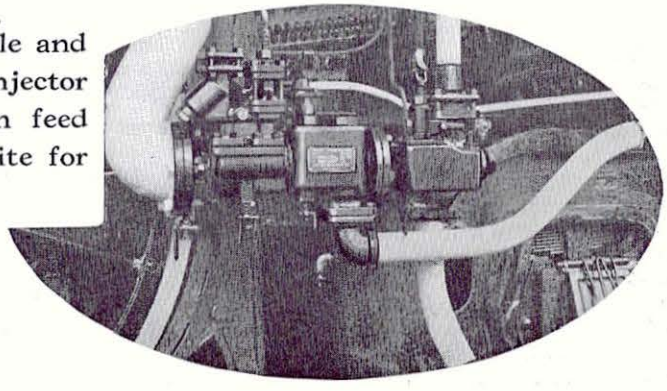
It operates on the injector principle, but because it always uses exhaust steam (when available) it reclaims heat and water otherwise wasted up the stack . . . thereby increasing boiler capacity and effecting substantial savings in fuel and water.

No complications are involved in operation. Opening the starting valve starts it working. Closing the valve stops it. To provide uninterrupted operation, it automatically changes over to live-steam operation when no exhaust steam is available. No attention, other than regulation of the water supply, is required.

Being a single unit, it can be applied in the same location as a non-lifting, live-steam injector. Application either to new or existing locomotives involves no undue complications.

Easily applied, easy to operate, dependable and reliable in service, the Elesco exhaust steam injector is an ideal combination of exhaust-steam feed water heater and injector boiler feed. Write for details.

ELESCO



THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, Inc.

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NEW YORK

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Peoples Gas Building
CHICAGO

Canada: The Superheater Company, Limited, Montreal

Superheaters - Feed Water Heaters - Exhaust Steam Injectors - Superheated Steam Pyrometers - American Throttles

Construction

CHICAGO & WESTERN INDIANA.—A contract has been awarded to the Ellington-Miller Company, Chicago, for the repair of the Wabash freight house at Chicago which was recently destroyed by fire. This freight house is owned by the C. & W. I., which leases it to the Wabash. It is being repaired at a cost of about $45,000.

NEW YORK, CHICAGO & ST. LOUIS—A contract has been awarded to the Railroad Water & Coal Handling Company, Chicago, for the construction of a water softening plant at Bellevue, Ohio. The plant will have a capacity of 30,000 gal. per hour and will cost about $30,000.

NORFOLK & WESTERN.—Bids will be asked within the next two months for building the 14.5-mi. extension up Levisa fork and Garden creek in Buchanan county, Va., to cost about $1,500,000 and for the 24 mi. Dismal Creek branch extension up Dismal creek, also in Buchanan county, to cost about $2,000,000. This work was reported in the *Railway Age* of February 2, page 213. Contracts were reported let in the *Railway Age* of January 26, page 183, for the new coal pier at Lambert Point, Va., to cost about $1,600,000. They were awarded as follows: Dredging, to Arundel Corporation, Baltimore, Md.; removing old breakwater, Alsop & Peirce, Newport News, Va.; steel work involving the use of 2,200 tons, to the Virginia Bridge & Iron Company, Roanoke, Va.; car dumper, Heyl & Patterson, Pittsburgh, Pa.; electrical machinery, Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.; foundations back of bulkhead, J. P. Pettyjohn & Company, Lynchburg, Va.; foundations for car dumper and fender system, Empire Construction Company, Baltimore, Md.

NORFOLK & WESTERN.—This road is now at work on an extensive rail renewal and maintenance program that will cost about $2,500,000. The work was begun February 1, and is expected to be completed by June 1. The project involves the purchase of more than 1,000 carloads of material, including 32,000 gross tons of No. 1 131-lb. rail, 2,300 tons of No. 2 rail of the same weight (sufficient to lay 165 miles of track) and 4,864,900 other track fixtures, such as rail joints, spikes, bolts, switches and frogs. Orders for 32,000 tons of 131-lb, rail were reported in the *Railway Age* of January 19. Most of the renewal work is being carried out on the Shenandoah and Radford divisions. On the former, 53.2 miles of new 131-lb. rail is being laid. Renewals on the Radford division include the laying of new rail from a point west of East Radford to Bristol, Va., a distance of 85 miles. Other rail renewals include 4.1 miles on the Norfolk division; 16.8 miles on the Pocahontas division and 5.9 miles on the Scioto division. Three extra forces of 45 men each have been organized for the work on the Shenandoah division and four gangs of the same number of men have been allocated to the Radford division.

Equipment and Supplies

LOCOMOTIVES

THE CHICAGO, BURLINGTON & QUINCY is constructing one 4-6-4-type locomotive in its own shops.

FREIGHT CARS

THE CHICAGO, BURLINGTON & QUINCY is contemplating the construction of 500 composite coal cars in its own shops.

PASSENGER CARS

THE DELAWARE RIVER JOINT COMMISSION is now asking for bids for the construction of 26 passenger cars for electric railway service, with four extra trucks to be delivered at Philadelphia, Pa. Bids should be identified as Contract No. 8 addressed to the secretary of the Joint Commission, Administration building, Bridge Plaza, Camden, N. J., and must be received by 1:30 p. m., E.S.T., March 15. George H. Earle is chairman and Joseph K. Costello is secretary of the Delaware River Joint Commission.

IRON AND STEEL

THE CENTRAL OF GEORGIA has ordered 3,800 tons of rails from the Tennessee Coal, Iron & Railroad Company.

THE SOUTHERN PACIFIC is inquiring for 360 tons of structural steel for a bridge at San Francisco, Cal.

THE LONG ISLAND is inquiring for 1400 tons of steel for grade crossing elimination work at St. Albans, Long Island, N. Y.

THE SOUTHERN has let a contract for the purchase of 16,000 tons of new rail for early delivery. The order was given to the Tennessee Coal, Iron & Railroad Company and the rail will be rolled at the Ensley, Ala. plant, near Birmingham.

NEW YORK CENTRAL.—Inquiries are being made for steel requiring about 400 tons for the grade crossing elimination work to be carried out on this road at West One Hundred and Seventy-first street, New York City.

SIGNALING

THE CHICAGO & WESTERN INDIANA has ordered from the Union Switch & Signal Company materials for an all-relay interlocking at the crossing of this road with the Rock Island, at Ninety-first street, Chicago. All functions will be operated from a centrally located panel on which there is an illuminated track model.

AIR CONDITIONING

THE UNION PACIFIC has placed orders for air-conditioning equipment for 40 chair cars and coaches including 25 sets from the Safety Car Heating and Lighting Company, 10 from the General Electric Company and five from the York Ice Machinery Corporation.

Supply Trade

The Constant Hopkins Company, Chicago, has been organized to succeed the Hopkins-Benedict Company.

S K F Industries, Inc., Philadelphia, Pa., has opened a new branch at 407 South Fourth street, Minneapolis, Minn., with **A. Kishkunas** in charge.

The American Rolling Mill Company, Middletown, Ohio, has appointed the **Edgecomb Steel Corporation,** Newark, N. J., a distributor of its Armco stainless steel sheets, plates and strips.

W. F. Gradolph, general sales manager of the **DeVilbiss Company,** Toledo, Ohio, has been elected vice-president in charge of sales, with headquarters at Toledo.

Frank A. Livingston, vice-president and treasurer of the **Ralston Steel Car Company,** Columbus, Ohio, has been elected president and general manager to succeed **Francis E. Symons,** deceased.

R. C. Overstreet has been appointed purchasing agent of the **Young Radiator Company,** Racine, Wis. Mr. Overstreet was formerly connected with the Mueller Furnace Company, Milwaukee, and purchasing agent for the Nash Motors Company of Racine.

Pressed Steel Car Trustees Request Authority to Issue Certificates

The trustees of the Pressed Steel Car Company have filed a petition in the United States District Court at Pittsburgh, Pa., for permission to issue $1,000,000 in certificates of indebtedness. Of this, $500,000 is to be issued immediately for carrying on the business, and the balance is to be used to finance future operations if necessary. The company has cash with which to pay off an outstanding issue of $650,000 of receivers' certificates of indebtedness, and has $1,500,000 in orders on its books. It is proposed that the $1,000,000 issue mature in 12 months and bear a 5 per cent interest rate. Hearing on the petition has been set for March 1.

Lima Locomotive Works, Inc., Annual Report

The Lima Locomotive Works, Inc., for the year ended December 31, 1934, reported a net deficit of $490,826, after all charges including depreciation and federal capital stock taxes. The comparable net loss for the year ended December 31, 1933, was $646,894.

While last year's deficit reduced the earned surplus from $919,978 to $429,152, the company's financial and current positions remained unusually strong. In connection with the former it has but one class of stock and no bonded debt nor bank or other loans; and within recent years it has acquired 41,400 shares of its own stock or 19.62 per cent of the total outstanding at a cost which was $122,909 less than the present market value of these shares. As for the current position, the

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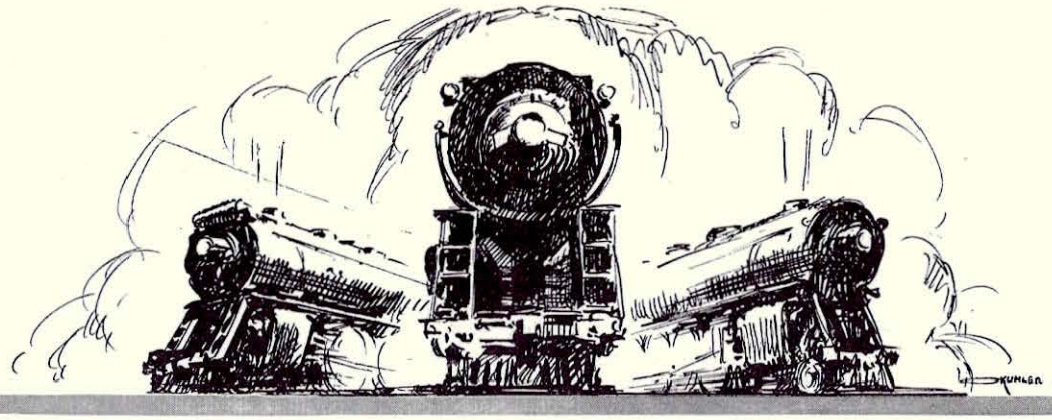

AMERICAN LOCOMOTIVE CO.

THE outstanding characteristic of the modern locomotive is its hauling capacity at speed. In this regard, modern locomotives having substantially the same starting force as locomotives built 10 years ago will haul approximately twice the train-load at speeds of 30 miles per hour and up. Not only are these modern locomotives the only ones capable of maintaining high speed schedules, but they likewise are the only locomotives capable of making great monthly and annual mileages and by the intensity of their use greatly decreasing many other costs of operation . . . . .

30 CHURCH ST., NEW YORK, N.Y.

balance sheet as of the close of last year shows total current assets of $4,635,830, including $2,253,503 in cash and United States government securities, as compared with total current liabilities of only $155,-299.

At the close of last year the company's wholly-owned subsidiary, the Ohio Power Shovel Company, was consolidated with the parent corporation and its business is now being carried on by the Lima Locomotive Works, Incorporated—Shovel and Crane division.

In commenting on the outlook for the company business in the future Joel S. Coffin, chairman of the board of directors says:

> It is generally recognized that the obsolescence of a large percentage of existing railroad motive power and the increasing need for modern locomotives with capacity for greater speed and capable of more economical operation point to a renewal of equipment buying by the railroads as soon as conditions make such a program practicable. No plan for breaking the jam which has locked up the durable goods industries during the five year depression period has been suggested that will more quickly and effectively accomplish this and afford extensive and permanent employment than large scale buying of modern, economical super-power locomotives and other modern railroad equipment.

Amendment to Locomotive Appliance Industry Code Approved

The National Industrial Recovery Board has announced approval of an amendment to the code of fair competition for the locomotive appliance industry, a division of the machinery and allied products industry. The amendment provides that no manufacturer shall make any product of the industry, identical with that originally designed by another manufacturer and bearing his name or trade-mark, without clearly showing, by tag or otherwise, that such product was not made by the original manufacturer; also, that detailed drawings of the products of the industry shall not be furnished to purchasers, though general drawings may be so furnished.

OBITUARY

Howard R. Gass, vice-president and a director of the St. Louis Car Company, St. Louis, Mo., died of a heart attack on February 13 on his farm at Cottleville, Mo., at the age of 52 years. Mr. Gass had been associated with the company for 16 years.

M. Frank Ryan, vice-president and western representative of the Pittsburgh Spring & Steel Company, Chicago, died at his home in that city on February 16. Mr. Ryan was born 61 years ago at Sterling, Ill., and had been connected with the company for 32 years.

Ellsworth Haring, president of the Elhar Steel Company, died on February 18 in the Prospect Heights hospital, Brooklyn, N. Y., where he had been operated upon for appendicitis. Mr. Haring was born at Monroe, N. Y., 60 years ago, and for many years was in the steel business. He was a regular attendant during a long period of time at the June Mechanical conventions at Atlantic City, N. J., and was also active in the affairs of the New York Railroad Club, having served at one time as chairman of its reception committee.

Financial

CANADIAN NATIONAL.—*Refunding.*—Authority to refund Canadian National maturities up to a limit of $200,000,000 was taken last week by the Bennett Government in a bill introduced in the House of Commons at Ottawa by Hon. E. N. Rhodes, Minister of Finance. Mr. Rhodes told the House that in the present year, if market conditions were favorable, a total of over $172,000,000 of maturities would be refunded at an approximate aggregate annual interest saving of over $2,-500,000, based on an average refunding interest rate of 3½ per cent, although many of the refunded issues will be at a much lower rate. He announced that last week an issue of $17,000,000 was refunded. It originally bore an interest rate of 4½ per cent, but it was refunded at 2 per cent, and, although it was refunded on a short term basis, it would later be extended over a long period.

Responding to a query, Mr. Rhodes gave to the House a list of the maturities that would be cared for under the authority of the legislation, in addition, to the $17,-000,000 already referred to, as follows:

> There is an issue of $60,833,333 of Grand Trunk four per cent perpetual guarantee stock which is callable at 100.
>
> There is an issue of Canadian National 4½ per cent thirty-year bonds, due September 15, 1954, amounting to $26,000,000, which is callable at 102; a Canadian National issue of 4½ per cent forty-year bonds, due December 1, 1968, amounting to $35,000,000, which is callable at 103; an issue of National Transcontinental Branch Lines 4½ per cent first mortgage bonds due October 1, 1955, amounting to $2,541,000, callable at par; Mount Royal Tunnel & Terminal 5 per cent first mortgage bonds due April 15, 1970, amounting to $952,893.33, callable at 105; an issue of Grand Trunk 7 per cent debentures due October 1, 1940, amounting to $23,740,000, callable at 102½; Canadian Northern 7 per cent debenture bond issue due December 1, 1940, amounting to $23,-779,000, callable at 102½. The total of the various issues I have just given aggregates $172,-846,226.

ERIE.—*Bonds.*—This company and the Nypano R. R. have been authorized by the Interstate Commerce Commission to extend to March 1, 1950, the maturity of $8,000,000 of prior lien mortgage extended 4½ per cent bonds of the New York, Pennsylvania & Ohio with interest during the period extended of 4¼ per cent, the Erie's participation in the transaction being in the role of guarantor. A considerable proportion of this issue is held abroad, and the Erie proposes to pay commissions to bankers of not more than 1⅞ per cent in connection with the extension of these holdings, and 1¼ per cent commission on domestic holdings extended—with a material reduction in the commission if the proportion of the issue presented for extension reaches 90 per cent of the total. J. P. Morgan & Co. is serving as the domestic depository for extension of these bonds, while Edward B. Smith & Co., Brown, Harriman & Co. are offering to purchase up to March 1 at principal and accrued interest the holdings of those who do not care to extend them.

ILLINOIS CENTRAL.—*Y. & M. V. Abandonment.*—The Interstate Commerce Commission has authorized the Yazoo & Mississippi Valley to abandon a branch line extending from Mattson, Miss., to Lombardy, 16.3 miles.

MINNEAPOLIS & ST. LOUIS.—*Foreclosure sale.*—In the absence of bidders the sale of the Minneapolis & St. Louis set for February 11 was postponed until March 13 it being anticipated that bidders may be ready within a month since a plan for the purchase of the road by a number of larger systems is under consideration. Previous attempts to sell the railroad were made on September 5 and November 12.

MISSOURI PACIFIC—*Reorganization Plans.*—Marion C. Early, special master for the federal district court at St. Louis on February 14 entered a report recommending that the trustees disaffirm purchase contracts for terminal properties involving Terminal Shares, Inc., an Alleghany Corporation subsidiary. The contracts were entered into between the Missouri Pacific and the Van Sweringen holding company in 1930 and, it is understood, would be assumed by the successor company to the Missouri Pacific under the Van Sweringen plan of re-organization. The master's report classed the contracts as "unduly burdensome." The stipulated payment of approximately $20,300,000 for the properties of the St. Joseph Belt Railway, the Union Belt Railway and terminal sites in north Kansas City and Kansas City was questioned by the Reconstruction Finance Corporation. Action of the R. F. C. in regard to participation in a Missouri Pacific reorganization will be predicated on the findings of the master's report. The report reads in part as follows:

> After due consideration of all the evidence and of the arguments of counsel, I have concluded that under the conditions which developed and which could not reasonably have been foreseen, the carrying out of the said contracts has become unduly burdensome and that they should be disaffirmed by the trustees unless the purchase price be reduced to not exceeding $14,000,000 as of the date of the contracts with interest and credits readjusted.

SAN ANTONIO, UVALDE & GULF.—*Abandonment Application Denied.*—The Interstate Commerce Commission has denied the application of this company and its trustees for authority to abandon a portion of its line extending from a point near Gardendale, Tex., through Fowlerton to a point on the north bank of the Frio river, 28.1 miles.

TEXAS & NEW ORLEANS.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon freight service over the line between Eunice, La., and Mamou, 8.9 miles.

Average Prices of Stocks and of Bonds

	Feb. 19	Last week	Last year
Average price of 20 representative railway stocks..	33.85	32.95	49.00
Average price of 20 representative railway bonds..	76.17	75.79	78.30

Dividends Declared

Erie & Pittsburgh.—7 Per Cent Guaranteed, $.87½, quarterly, payable March 9 to holders of record February 28.

North Pennsylvania.—$1.00, quarterly, payable February 25 to holders of record February 18.

Union Pacific.—$1.50, payable April 1 to holders of record March 1; Preferred, semi-annually, $2.00, payable April 1 to holders of record March 1.

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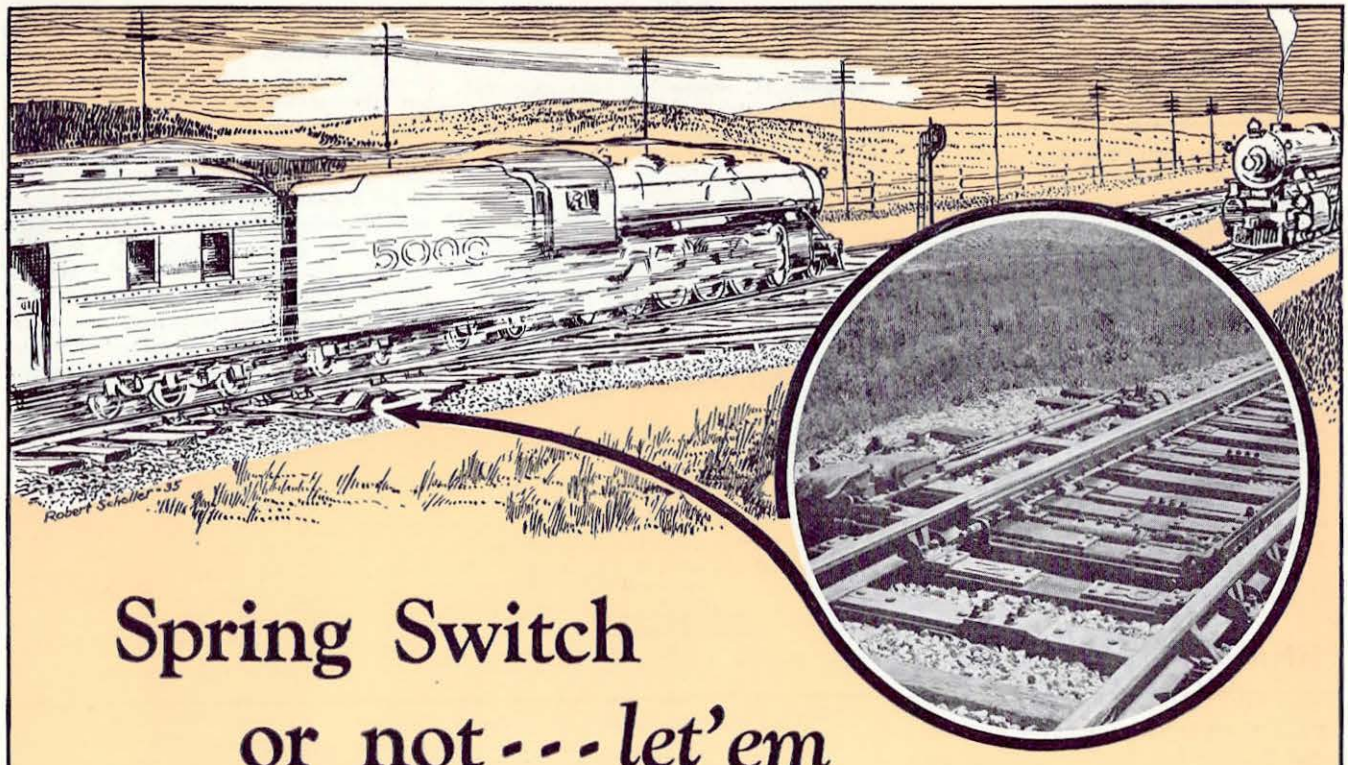


Spring Switch or not - - - *let'em* "HIGH BALL"

Full speed may now be maintained for main line facing point moves over spring switches equipped with the "Union" Style S-1 Mechanical Facing Point Lock. » » » » »

Simple in design and rugged in construction, this automatically operated facing point lock has proved an incentive to use spring switches at ends-of-double-track, passing sidings and yard leads, where train movements on certain routes predominate. It insures the equivalent of interlocking protection for main line switches so that there is no occasion for speed restrictions for facing point main line movements over switches so equipped. » » » »

Ask our nearest district office for details.

874

1881 **Union Switch & Signal Co.** 1935

SWISSVALE, PA.

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

Railway Officers

EXECUTIVE

Maurice K. Dugan, assistant to the chairman of the New York, New Haven & Hartford, has been appointed executive representative, in which capacity he will have charge of the office which Howard S. Palmer, president of the New Haven, has established in Boston, Mass., in addition to the office which he maintains in New Haven, Conn. Mr. Dugan will represent Mr. Palmer in Boston and will also handle publicity matters affecting that part of the New Haven system. Mr. Palmer expects to spend Monday and Tuesday of each week in his Boston office, in order to maintain a closer contact with the New Haven's affairs in the Boston territory.

FINANCIAL, LEGAL AND ACCOUNTING

Fred L. Wallace, commerce attorney of the Ft. Worth & Denver City and the Wichita Valley, has had his title changed to general and commerce attorney, with headquarters at Ft. Worth, Tex.

OPERATING

V. D. Thayer, car service agent for the Delaware, Lackawanna & Western at Scranton, Pa., has been appointed superintendent of car service, with the same headquarters. The position of car service agent has been abolished.

TRAFFIC

R. W. Bramwell, traffic manager (solicitation) of the Pittsburgh & West Virginia, has moved his office from Pittsburgh, Pa., to Detroit, Mich.

T. A. Martin, general agent for the Illinois Northern, has been appointed to the newly-created position of general freight agent (solicitation), with headquarters at Chicago.

W. M. Cook, general agent for the Missouri Pacific, with headquarters at San Francisco, Cal., has been promoted to the newly-created position of assistant traffic manager with the same headquarters.

Hugh I. Scofield, general passenger agent of the Denver & Rio Grande Western, with headquarters at Denver, Colo., has had his title changed to passenger traffic manager.

William T. Boardman, assistant general freight agent on the Gulf, Mobile & Northern, has been appointed foreign freight agent, with headquarters as before at Mobile, Ala.

J. R. McClurken has been appointed general merchandise agent for the Louisiana & Arkansas and the Louisiana, Arkansas & Texas, with headquarters at Shreveport, La. Mr. McClurken has also been appointed general freight agent of the Louisiana, Arkansas & Texas Transportation Company.

Rodney H. Reese has been appointed general agent for the Green Bay & Western, with headquarters at Pittsburgh, Pa., succeeding **W. D. Lambert,** who has resigned.

E. G. Gustafson, general agent for the Minneapolis & St. Louis, with headquarters at Chicago, has been promoted to the newly-created position of assistant general freight agent at that point.

MECHANICAL

C. R. McEwen, a draftsman in the motive power department of the Illinois Central, with headquarters at Paducah, Ky., has been promoted to engineer of tests, with the same headquarters, to succeed **J. L. Carver,** who has been advanced to mechanical engineer.

OBITUARY

S. D. Harris, fuel agent of the Chicago & Western Indiana and the Belt Railway of Chicago, with headquarters at Chicago, died on January 27.

C. H. Dyson, fuel agent of the Baltimore & Ohio, with headquarters at Baltimore, Md., died at Miami, Fla., on February 15. Mr. Dyson was president of the International Railway Fuel Association from 1930 to 1933.

George S. Wright, who retired in 1931 as general storekeeper of the Elgin, Joliet & Eastern, died on February 2 at his home at Joliet, Ill., following a long illness. Mr. Wright, who was 73 years old, was born at McGregor, Iowa, and first entered railway service with the Iowa Central (now part of the Minneapolis & St. Louis). He went with the E. J. & E. in 1896 as general storekeeper and served with this company continuously until his retirement.

Alfred P. Thom Dies

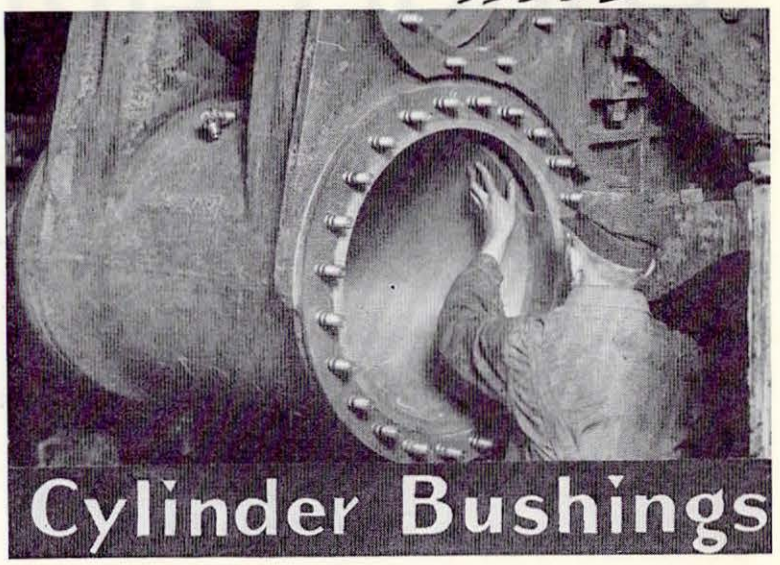
Alfred Pembroke Thom, associate general counsel of the Association of American Railroads, who for many years, as vice-chairman and general counsel of the Association of Railway Executives, had been in charge of the legal and legislative activities of the railroads at Washington, died at his home in Washington on February 15, after an illness of several weeks. He had recently passed his eightieth birthday and he had relinquished most of his activities nearly two years ago, when he retired as general counsel, but he had continued to work at his office until a few weeks before his death. As general counsel of the Association of Railway Executives and its predecessor, the Railway Executives' Advisory Committee since 1916, Mr. Thom had been the spokesman for the railroads at the Capitol on matters pertaining to legislation affecting transportation and had also appeared for them in some of the more important general cases before the Interstate Commerce Commission. His first important work for the railroads generally was in connection with the investigation of the entire subject of transportation regulation conducted by the joint congressional committee known as the Newlands committee in 1916. The investigation was interrupted by the war, but the presentation made under Mr. Thom's direction at that time had a great influence on many phases of the transportation act of 1920. Mr. Thom also represented the railroads in the protracted hearings regarding the terms of the federal control law, after the roads had been taken over by the government at the end of 1917, and the conditions under which they were later returned to private control in 1920 and had a most important influence on some of the provisions of that legislation, although some of the more important provisions were in a form opposed by him as representing the roads. After the law

Alfred P. Thom

was passed, however, he supported it for several years as against repeated efforts in Congress to repeal Section 15a and other provisions without putting anything in their place for the protection of railroad interests.

Alfred Pembroke Thom was born at Elkington, Va., on December 15, 1854. He was educated in private schools, at Richmond College, and at the University of Virginia. He was admitted to the bar in 1876 and for many years practiced at Norfolk, Va., as a member of the firms of Ellis & Thom, Ellis, Tunstall & Thom, and White, Tunstall & Thom. In 1891 he was appointed receiver of the Atlantic & Danville, now a part of the Southern, and in 1894 he became general counsel for that road. In 1899 he was appointed counsel for the Southern and in 1902 counsel in Virginia for the Southern. In 1905 he was appointed general counsel of the Southern lines east and when the executives' advisory committee was organized he became general counsel for that organization, later resigning from his office with the Southern. In 1917 he became general counsel of the Association of Railway Executives and in 1922 he was also made general counsel of the American Railway Association. In March, 1933, his title was changed to associate general counsel, at the time when R. V. Fletcher was elected general counsel of the association, and upon the organization of the new association which succeeded the two older associations last Fall Mr. Thom was appointed to the same office with it.

100% APPLICATIONS Insure Maximum Economies



LOCOMOTIVES completely equipped with HUNT-SPILLER *Air Furnace* GUN IRON Parts are outstanding for their dependable performance and economical operation.

Records show that many thousands of installations of H S G I Cylinder Bushings have been in service for years. Such service has proved to be a big factor in the promotion of efficiency, reduction of fuel consumption and lowering of maintenance costs.

Economical service of this nature is indispensable in the present modern locomotive operation. Application of all the H S G I parts listed below insures maximum economies.

H S G I
Reg. U. S. Trade Mark

Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings

Parts Finished For Application

Dunbar Sectional Type Packing
Duplex Sectional Type Packing for Cylinders and Valves
(Duplex Springs for Above Sectional Packing)
Cylinder Snap Rings
Valve Rings All Shapes

HUNT-SPILLER MFG. CORPORATION
J. G. Platt, Pres. & Gen. Mgr. V. W. Ellet, Vice-President.

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383 Dorchester Ave. South Boston, 27, Mass.
Canadian Representative: Joseph Robb & Co., Ltd., 70 North Bank Rd., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co., 30 Church Street, New York, N. Y.

HUNT-SPILLER *Air Furnace* GUN IRON

BULLETIN 2

HAND FIRING

IS *Expensive* FIRING

The graph below is taken from "The Economical Use of Railroad Fuel", published by the Fuel Conservation Section, Division of Operation, U. S. R. A.

The graph was made from actual tests and shows the effect on superheat each time the firedoor is opened to supply coal by hand.

TYPE "BK" STOKER

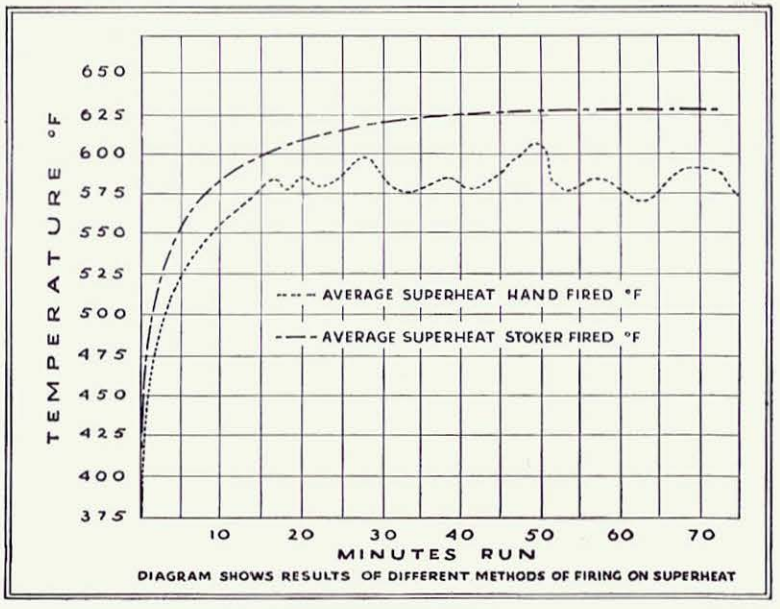

DIAGRAM SHOWS RESULTS OF DIFFERENT METHODS OF FIRING ON SUPERHEAT

HAND FIRING IS EXPENSIVE FIRING

THE STANDARD STOKER COMPANY, INC.

NEW YORK CHICAGO ERIE

Consistently Positive Operation—Long or Short Trains

Signals Always Distinct—No Interference Nor Overlapping

Wear Does Not Affect Consistent Operation

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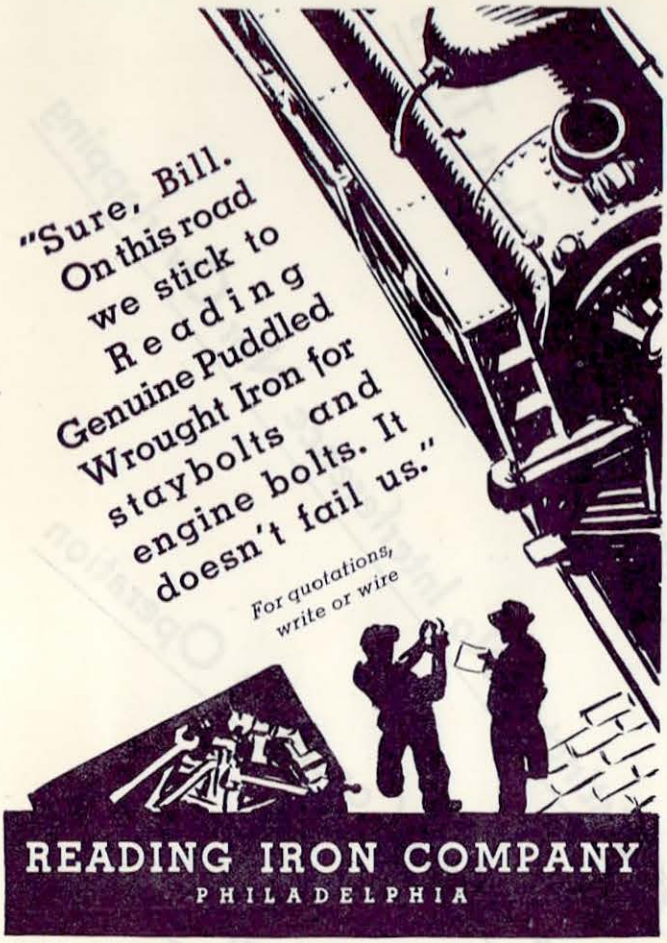

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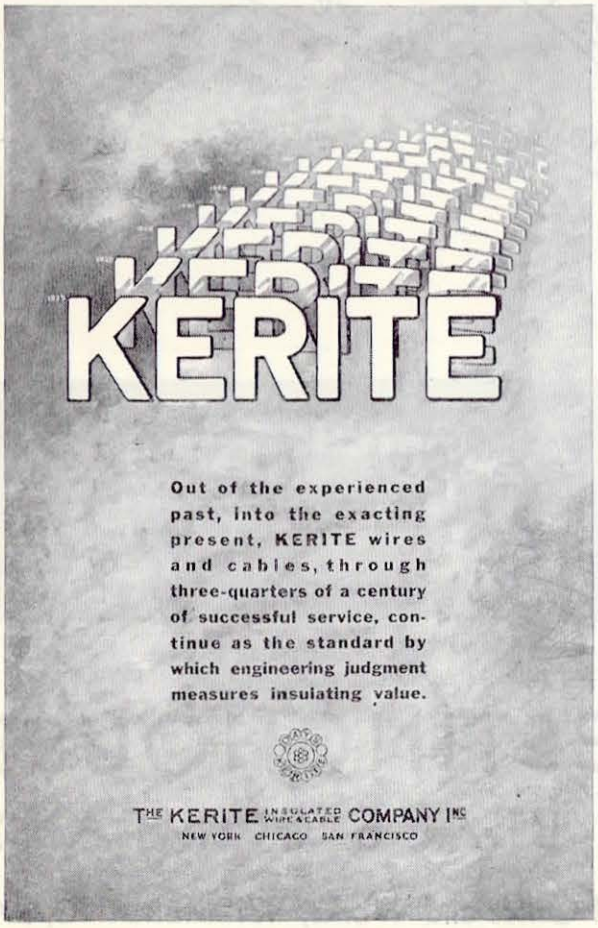

KERITE
Out of the experienced past, into the exacting present, KERITE wires and cables, through three-quarters of a century of successful service, continue as the standard by which engineering judgment measures insulating value.
THE KERITE INSULATED WIRE & CABLE COMPANY INC
NEW YORK CHICAGO SAN FRANCISCO

High-Speed Line
The Delaware River Joint Commission

Sealed bids will be received for the construction of twenty-six Passenger Cars for electric railway service, with four extra trucks to be delivered on the tracks of the Fern Rock Terminal Yard, Broad Street Subway, Philadelphia to be identified as Contract No. 8 The Delaware River Joint Commission High-Speed Rail Transit Line, at the office of the Secretary of the Joint Commission, Administration Building, Bridge Plaza, Camden, New Jersey, until 1.30 P. M. o'clock, Eastern Standard Time, Friday, March 15th, 1935, and then and there will be publicly opened and read.

A more complete description of the work and full information for bidders is given in the specifications and contract drawings which may be obtained upon deposit of $25.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Without exception no bid will be considered unless the bidder executes Certificate of Compliance, U. S. Government Form P. W. A. No. 61, Revised March, 1934, to the effect that the bidder is complying with and will continue to comply with each applicable Code of fair competition, or in the absence of such Code or Codes, with the President's Reemployment Agreement. A copy of this Certificate included in the "Information for Bidders" must be executed.

Contractors shall pay all employees directly employed on the work the following minimum rates of wage, as prescribed by the Federal Emergency Administration of Public Works: Skilled, $1.20 per hour, Unskilled, $0.50 per hour, and Semi-skilled and others as called for in the Specifications.

The Contract is subject to the approval by the Federal Emergency Administration of Public Works. The right is reserved to reject any or all bids.

GEORGE H. EARLE, Chairman
THE DELAWARE RIVER JOINT COMMISSION

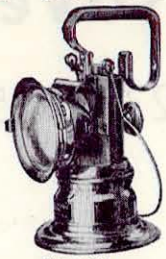
JOSEPH K. COSTELLO, Secretary
THE DELAWARE RIVER JOINT COMMISSION

NATIONAL CARBIDE

Y-199
Handy Light

LANTERNS and National Carbide V. G. Flarelights —the highest development in carbide lighting equipment.

Lanterns with blue rear light for car inspection — with red rear light for motor car headlights and signal lights — handy lamps and portable lights for track maintenance —standard on many railroads.



WLI-CI
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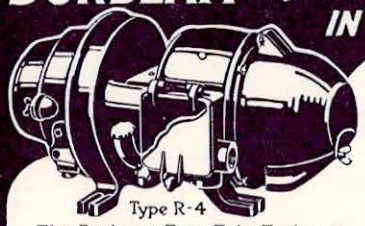
NATIONAL CARBIDE SALES CORP.
LINCOLN BLDG., 60 EAST 42ND ST., NEW YORK, N.Y.

SUNBEAM EQUIPMENT FOR SAFETY IN TRAIN CONTROL



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The Sunbeam Four-Pole Turbo-Generator has a wave-wound armature and four brushes that insure freedom from voltage ripple. A responsive governor maintains constant speed and voltag

SUNBEAM Train Control Turbo-Generators operate at constant speed, insuring close voltage regulation. Designed especially to meet the critical demands of train control, they effect great economy in steam and maintenance costs. Their performance in actual use demonstrates their reliability over long periods of service. Write for further details.

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NEW YORK SAN FRANCISCO PHILADELPHIA EVANSVILLE, INDIANA, U. S. A. DENVER RICHMOND INDIANAPOLIS

Pittsburgh Spring & Steel Co.

1417 Farmers Bank Building, Pittsburgh, Pa.

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Carbon, Vanadium, Silico-Manganese Steels.
Licensed manufacturers under patents for "Coil-Elliptic" groupings.

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STEAM COUPLERS ARA Standard

VAPOR SYSTEM Thermostatic Control

FLEXIBLE CONDUITS in place of Steam Hose

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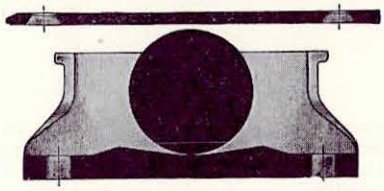
VAPOR SYSTEM

VAPOR CAR HEATING CO., Inc.
RAILWAY EXCHANGE, CHICAGO



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Canadian Representatives
The Holden Co., Ltd.
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COLUMBUS, OHIO

MANUFACTURER of Side Frames and Bolsters for 4-Wheel and 6-Wheel Freight Cars and Locomotive Tenders, A. R. A. Couplers, Yokes and Car Castings.

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GOLD CAR HEATING & LIGHTING CO.
NEW YORK

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EDUCATIONAL

THE Railway Educational Bureau, Omaha, Neb., offers a distinctive education service for Supervisors and other employes. Write for FREE Special Bulletin.

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BUY GOOD USED FRAMES

Save 50%! *Two* Sets for *One!*

Iron & Steel Products, Inc.
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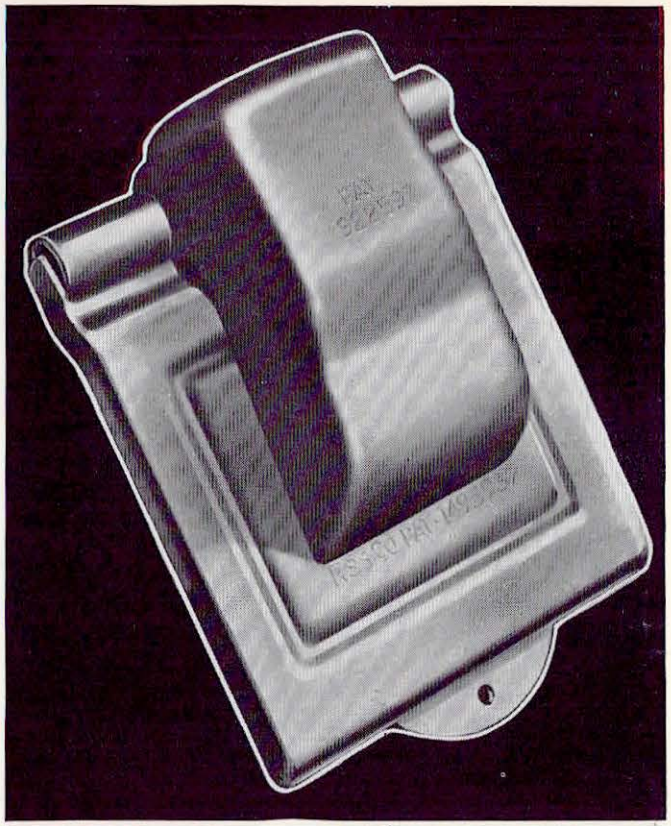

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The three parts, like all "Railway" Products, are manufactured to provide long dependable service with minimum attention and replacements.

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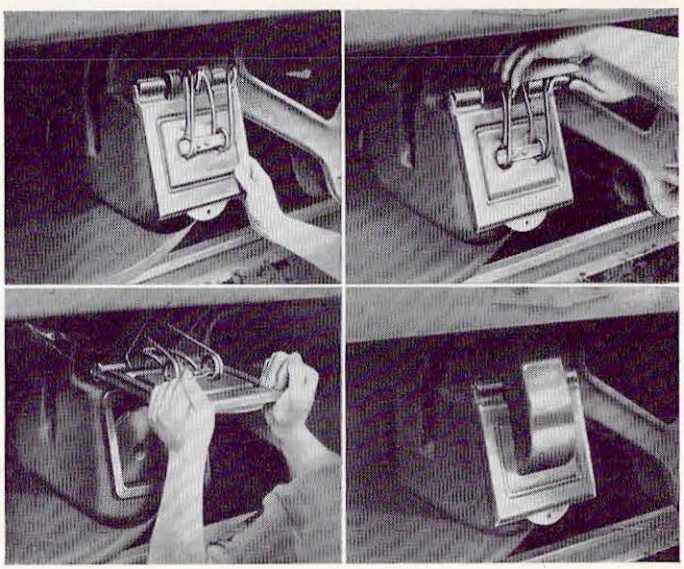

American Locomotive Company

Railway Steel-Spring Division
30 CHURCH ST., NEW YORK

Branch Offices:

Chicago, Ill. Washington, D. C. Cleveland, Ohio Pittsburgh, Pa. Montreal, Que.
St. Paul, Minn. St. Louis, Mo. Denver, Colo. San Francisco, Cal.

Developments in Automatic Interlocking*

Automatic interlockings were developed and first installed at gauntlets and at simple crossings of single-track lines. For several years such plants were limited to simple track layouts where no switches were located within home signal limits. However, in more recent years, as progress has been made in developing circuits and adapting principle of automatic control to operating conditions, it has been found that automatic interlockings can be used at many locations where mechanical plants had previously been considered necessary. Therefore, by reason of their reduced cost of construction and operation, automatic interlockings have been installed at crossings that have not previously been protected because of the expense involved in manually-operated plants. Furthermore, to reduce operating costs, many manually-operated plants have been replaced by automatic interlockings.

In view of the many new developments, it might now be well to consider the application of automatic plants, not only at outlying unprotected crossings, but also for the replacement of manually-operated plants at numerous locations.

* Railway Signaling, December 1934.

UNION SWITCH & SIGNAL COMPANY
Swissvale, Pennsylvania

GENERAL RAILWAY SIGNAL COMPANY
Rochester, N. Y.

120

HISTORY IN THE MAKING

During 1934, 19 automatic interlocking plants were placed in service, involving 152 signals. In most instances, the savings effected by the installations will pay for the changes in from one to three years.